SCHOLASTIC PERFORMANCE, VERBAL WORKING MEMORY AND ITS RELATIONSHIP WITH BEHAVIORAL AND EMOTIONAL PROBLEMS IN CHILDREN OF 9-10 YEARS

Dissertation submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

In partial fulfilment of the regulations
For the award of the degree of

M. D BRANCH –XVIII

M D. PSYCHIATRY

INSTITUTE OF MENTAL HEALTH

MADRAS MEDICAL COLLEGE

THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY

CHENNAI, INDIA.

April 2015

CERTIFICATE

This is to certify that this dissertation titled "**SCHOLASTIC PERFORMANCE, VERBAL WORKING MEMORY AND IT'S RELATIONSHIP WITH BEHAVIORAL AND EMOTIONAL PROBLEMS IN CHILDREN OF 9-10 YEARS.**" submitted by **Dr. P. Mangaiyarkarasi**, appearing for M.D. (Psychiatry) degree examination in April 2015 is an original bonafide record of work done from August 2014 to September 2014 by her under my guidance and supervision in part fulfilment of requirements of the Tamil Nadu Dr. M.G.R. Medical University, Chennai. I forward this to the Tamil Nadu Dr. M.G.R. Medical University, Chennai, Tamil Nadu, India.

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DECLARATION

I, **Dr. P. Mangaiyarkarasi**, solemnly declare that this dissertation **"SCHOLASTIC PERFORMANCE, VERBAL WORKING MEMORY AND IT'S RELATIONSHIP WITH BEHAVIORAL AND EMOTIONAL PROBLEMS IN CHILDREN OF 9-10 YEARS."** was done by me at Corporation Primary Schools Chennai, from August 2014 to September 2014, under the guidance of The Professor and the Head of the Department, Department of Psychiatry, Institute of Child Health, and under the supervision of Director of Institute of Mental Health, Chennai. This dissertation is submitted to the Tamil Nadu Dr.M.G.R Medical University, Chennai – 32 in partial fulfilment of the University requirements for the award of the degree of M.D., Psychiatry.

Place: Chennai.

Date: 25.09.14 **P. Mangaiyarkarasi**

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I thank all parents of those student who gave consent to participate in the study and kind cooperation from teachers need special mention here.

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INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
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CERTIFICATE OF APPROVAL

To
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Postgraduate MD(Psychiatry),
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Chennai – 600 003.

Dear Dr. P.Mangaiyarkarasi,

The Institutional Ethics Committee has considered your request and approved your study titled **"Scholastic performance, verbal working memory and its relationship with behavioral and emotional problems in children of 9 – 10 years" No.11082014.**

The following members of Ethics Committee were present in the meeting held on 05.08.2014 conducted at Madras Medical College, Chennai-3.

1.	Dr.C.Rajendran, M.D.,	: Chairperson
2.	Dr.R.Vimala, M.D., Dean, MMC, Ch-3	: Deputy Chairperson
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10.	Thiru S.Govindasamy, B.A., B.L.,	: Lawyer
11.	Tmt.Arnold Saulina, M.A., MSW.,	: Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

19/8/14

Member Secretary, Ethics Committee

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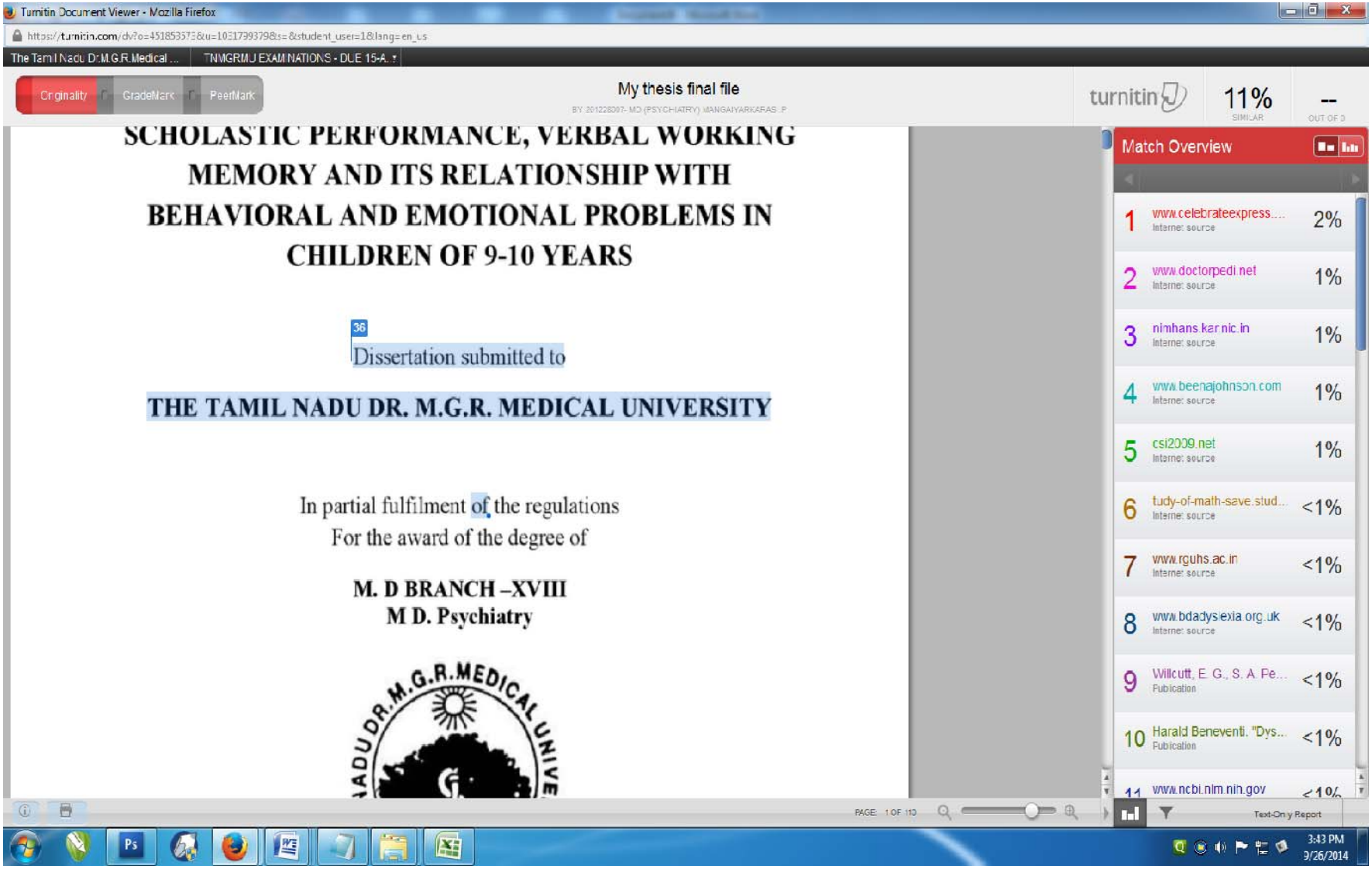
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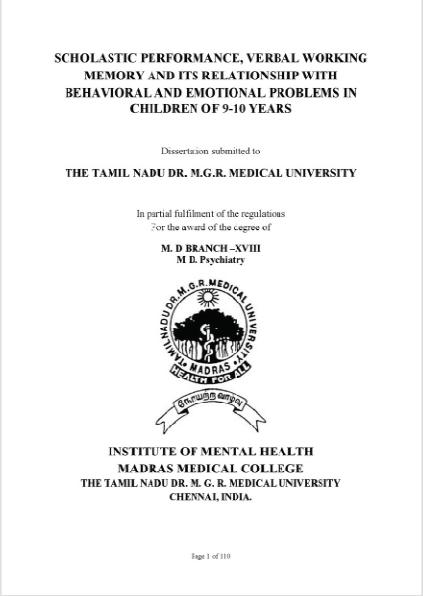

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SCHOLASTIC PERFORMANCE, VERBAL WORKING MEMORY AND ITS RELATIONSHIP WITH BEHAVIOURAL AND EMOTIONAL PROBLEMS IN CHILDREN OF 9-10YRS .

ABSTRACT

BACKGROUND

Education is one of the most important aspects of human resource development. Every child should have the opportunity to achieve his or her own academic potential. Indian parents give high priority to their children's education. Therefore, a child who does not do well in studies is of major concern in the family unit.

POOR SCHOLASTIC PERFORMANCE

Poor marks must be seen as a symptom of a larger underlying problem in children. This symptom results in child having low self-esteem. If the child is not performing, there has to be an underlying cause that needs to be assessed.

Specific learning disorder may be one of the causes of poor scholastic performance .Specific learning disorder is a developmental condition which gets expressed from the primary schooling period .

PRIMARY OBJECTIVE

To compare Scholastic Performance and to find its relationship with behavioural and emotional problems in children.

SECONDARY OBJECTIVES

- To compare the socio demographic profile and other related factors with learning problems.
- To find children with specific learning disorders.
- To find correlation between scholastic performance and verbal working memory.

HYPOTHESIS

1. Specific learning Disability is one of the important causes of Poor Scholastic Performance.
2. Children with Specific Learning disorders have more internalizing and externalizing behavioral problems.
3. Verbal Working Memory is impaired in children with Specific Learning disorders.
4. Verbal and Performance IQ discrepancies are seen in children with Specific learning disorders.

METHODOLOGY

This is a cross sectional comparative study conducted in primary school children.**Inclusion Criteria** :Students of class IV & V in Corporation Primary Schools, attached to ICH School Health Program, Egmore, Chennai **Exclusion Criteria :**Mental retardation,Any chronic medical illness causing frequent absenteeism, sensory and neurological abnormalities Visual, hearing and speech impairment,Muscular dystrophy, Cerebral palsy, Cognitive delay Epilepsy.

Permission Obtained from DC education and written order from E.O Educational Officer, Corporation Schools, Chennai Corporation. Permission also obtained from Institute of Child Health school health programme and Director, ICH.

MATERIALS:

Semi-structured proforma for socio-demographic and family characteristics, Child Behaviour Checklist (ASEBA School Age Forms),Malins Intelligence Scale for Indian Children (MISIC) ,Specific learning disability (SLD) battery ,Seguin Form Board Test (SFBT).verbal working memory N back test. *Statistics used:* Pearson's correlation, $\chi 2$ test, logistic regression using SPSS ver. 200 .

RESULTS:

1.About 19 children in the study group has specific Learning Disorders, in that 13 children have reading disorder and disorders of written expression and 15 children have arithmetic disorder and 6 children have arithmetic disorder alone and 9 children have mixed type with all three disorders together.2. Habit of watching TV more than 3 hours is seen in children with SLD.3.When comparing Behavioral and emotional problems, study group had more internalizing (Anxiety) and externalizing problems (ADHD, ODD) 4.Children with SLD have more ADHD features and somatic complaints. 5.Verbal & performance IQ scores are low in SLD children,6.SLD children have impaired verbal working memory.

CONCLUSION

Scholastic backwardness in children is a complex issue. . Family dynamics and socio demographic background also plays a major role in the learning process impaired cognitive functions and verbal working memory were seen in these children with learning disorders, which plays a crucial role in remediation. All these factors have to be considered while designing intervention strategies. It is vitally important that students with specific learning disorders are identified early and receive these types of interventions.

KEYWORDS

Scholastic Backwardness, Emotional and behavioral problems Specific learning disorders, Verbal Working memory.

INTRODUCTION

A country's destiny is shaped in classroom. Schools are basic platforms for the students from which they acquire knowledge and later on shape their future. Teachers not only teach but also develop confidence, courage and good conduct in students. In a developing country like, India, where academic achievement is given foremost importance, a child who does not do well in studies becomes a source of significant stress to the family unit causing low self-esteem anxiety, behavioural problems in children. Hence scholastic problems attract the attention of everyone who is interested in the welfare of the child.

A child whose scholastic problems have not been adequately addressed and sorted out, is bound to carry a lifelong burden, as a result of which he/she would have difficulties with completion of school, interpersonal relationships, higher education, prospects for employment, marriage etc.

Educational System in India

Sarva Shiksha Abhiyan (**SSA**) is Government of India's flagship programme for achievement of Universalization of Elementary Education (**UEE**). SSA is being implemented in partnership with State Governments to cover the entire country. In Tamil Nadu, this programme is covering all

corporations, government and government aided schools. The system in I to VIII standard is as follows:

- I to IV is called as **SABL** – **S**implified **A**ctivity **B**ased **L**earning.
- V standard is **SALM** – **S**implified **A**ctive **L**earning Methodology.
- VI to VIII standard **ALM** –**A**ctive **L**earning **M**ethod is used.

SSA covers I to VIII standard, Which is mainly activity oriented and uses various Flash cards and play materials and makes learning more interactive, enthusiastic and self-directed. Competencies are split into various parts and converted into different activities. Child's progress is assessed through formative and summative assessment charts and their overall activity and not by marks alone.

Poor school performance is one of common reasons for referral to the Child Guidance Clinic.

REVIEW OF LITERATURE

Poor Scholastic Performance

Poor marks must be seen as a symptom of a larger underlying problem in children. If the child is not performing, there has to be an underlying cause that needs to be assessed and accurate and appropriate remedial measures to be taken as early as possible, so that the academic performance of such children can be made further better.

Contributory Factors

In a multi-linguistic Indian educational setting, children often have to learn to study through the medium of language not their own. They also need to learn two to three languages simultaneously. The following are the common causes for poor scholastic performance of the child.

In the home environment

- Deprived, discordant, un-stimulating home environment
- Lack of adequate facilities for studying, Noisy homes
- Lack of encouragement for studying and lack of role models
- Parental illiteracy
- TV viewing habits
- Significant life events
- Child abuse

- Single parent, separated parents
- Alcoholic, workaholic parents
- Exposure to toxins such as lead, endosulfan and other
- Organophosphate compounds
- In the adolescents - any personal distractions if present and attitude towards studies contribute to academic performance.

In the school environment

- Recent change of school/ medium of teaching
- Over-expectation parents and teachers
- Poor / inadequate teaching methods
- Overcrowded classrooms
- Role based learning methods and poor study skills
- Teacher insensitivity to problems of children with poor scholastic performance

In the child

Mental retardation (MR): Children with mental retardation have a significantly sub average general intellectual functioning, with IQ below 70.

Learning Disability - About 10% of school going children have Etiology is diverse and many factors may be overlapping

Language disorders: McKeith and Rutter estimated on the basis of literature review that 1% of all children enter school with a marked language handicap.

Hearing impairment: Even mild to moderate hearing loss in childhood is associated with poor language development in early childhood and with lower educational achievement and employment opportunities later in life.

Visual Impairment: Visual impairment, often unidentified, may cause learning difficulties. Children with visual impairment may present with certain features such as deterioration in handwriting and slowness in copying from the board.

Hypothyroidism: Hypothyroidism is a cause for scholastic backwardness if the condition is not diagnosed and treated early.

Prematurity, low birth weight: Research has consistently demonstrated a greater risk for learning-related problems in preterm, low birth weight children.

Developmental coordination disorder (DCD): Children with developmental coordination disorder have difficulty learning and performing age-appropriate perceptual-motor skills in the absence of diagnosable neurological disorders

Attention Deficit Hyperactivity Disorder (ADHD): Untreated ADHD is one of the important causes for poor School Performance. Difficulty in focusing attention leads to poor achievement in scholastic skills. **Chronic and recurrent illness:** Several congenital or chronic medical problems in the child contribute to learning problems. This may be due to the direct effect of the condition itself, or due to effects leading to recurrent school absenteeism, adverse effects of medication and poor self esteem affecting motivation and performance.

Evaluation of Scholastic Backwardness

1. Look for external factors
2. Rule out physical problem
3. Behavioural analysis
4. Assessment of intelligence
5. Assessment of scholastic skills
6. Neuro Psychological evaluation

Specific Learning Disorder (SLD)

Specific learning disability will be dealt with in some detail as this is an entity that requires special mention and it is a potentially correctable problem**.** SLD is one of the main reasons for scholastic backwardness in children. In General, they occur in approximately 10% of school going children. Prevalence is as low as 3% to as high as 20.6%.

Children with learning disorders exhibit academic difficulties out of proportion to their intellectual capacity.

Warning Signs of Learning Disability

A child with SLD would be giving cause of concern - particularly as regards to reading, writing and spelling, all very important skills in the school curriculum.

With experience, however, and from the findings of research studies, it is now evident that there are many signs well before school age, which may suggest such a profile and the consequent difficulties ahead. These may be called as early warning signs of SLD. Therefore, it is important not to ignore a delay in speech. A child who has not spoken even a single word by 1 year 5 months, around 3 words by 1 ½ yr, 2 word sentences by 2 yr or 3 word sentences by 3 yr must be given the benefit of a hearing assessment and an assessment of whether the child is 'at risk' for learning disability.

Early warning signs include: late talking, inadvertently hitting or grabbing instead of communicating verbally, pronunciation problems, slow vocabulary growth, difficulty rhyming words, trouble learning numbers, the alphabet, days of the week.

The concepts of learning disorders have undergone distinct phases of development in history. The study of learning disorders began with Strauss and colleagues in early 1940s. They used the term 'Brain injured children' and they established the following seven criteria to classify, namely perceptual disorders, perseveration, conceptual or thinking disorders behavioural disorders, soft neurological signs, history of neurological impairment, with no h/o mental retardation.

In 1960s, there was a shift in terminology to 'Minimal brain Dysfunction' which was popularized by clements. In 1962 kirk coined the term 'Learning Disability'. Since then a number of definitions have been proposed.

Definition of Specific Learning Disability (SLD) by the National Joint Committee on LD

SLD refers to a heterogeneous group of disorders where there is significant difficulty in both acquisition and use of listening, reading, writing, reasoning, and arithmetic skills. These disorders are very intrinsic to the individual and it is a neurodevelopmental disorder which gets expressed from early childhood.

As per the international classification of diseases (ICD – 10 by the World Health Organization) learning disorders are termed as Specific Developmental Disorders of Scholastic Skills (SDDSS).

The [26] ICD-10 and [28] DSM V criteria for Specific Learning Disorders are being attached in Appendix.

ICD-10 notes five difficulties regarding diagnosis and differential diagnosis:

1. Differentiation of the disorder from normal variations in scholastic achievement.
2. Consideration of the normal developmental course
3. Interference with learning and teaching
4. Underlying abnormalities in cognitive processing
5. Uncertainties over the best way of sub differentiating SDDSS.

Based on these considerations, the following diagnostic guidelines for all SDDSS have been suggested [26] (ICD-10):

- **Clinically significant degree of impairment**: This is judged on the basis of severity (e.g. occurrence in less than 3 per cent of schoolchildren), developmental precursors (e.g. speech or language

disorder in preschool years), and associated problems (e.g. inattention).

- **Specific impairment not explained solely by mental retardation or by lesser impairments in general intelligence**: For this requirement to be met, individually administered and standardized IQ scholastic achievement tests are obligatory to demonstrate that the child's level of achievement is substantially below the expected level compared to a child of the same mental age.

- **Developmental nature of the impairment**: This must be demonstrated by the presence of the disorder during the early years of schooling and by exclusion of impairment acquired later. The child's history of school progress is decisive in this respect.

- **Absence of external factors that could explain the impairment**: SDDSS is thought to be mainly based on factors which are inherent to the child's development and not due to inadequate schooling or any other environmental factors such as absence from school or educational discontinuities. However, such conditions may occur, making the diagnostic process difficult.

- **Exclusion of visual and hearing impairments**: By definition, SDDSS do not occur as a result of impairment of sensory function, such as visual or hearing impairment.

The main differential diagnostic task is distinguishing SDDSS from neurological disorders or impairments that may also be responsible for the impairment of scholastic skills (e.g. alexia, aphasia, agraphia, apraxia). In cases of normal child development prior to the manifestation of a defined neurological disorder, differential diagnosis is not difficult. However, if minor neurological signs (soft signs) were diagnosed previously, independent of any defined disorder, and the findings persist, it may be difficult to distinguish recent symptoms from previous ones. In such cases, associated disorders or symptoms should be classified separately in the appropriate neurological section of the classification.

Sub Types

1. Specific Reading Disorder (Dyslexia)

This disorder is characterized by specific impairments in the reading skills and also reading comprehension. In spite of adequate and effective teaching and favourable classroom environment these children would find difficulty in decoding words, and presents with specific phonological deficits rather than an overall cognitive impairment.

Definition

Reading disorder is the diagnostic term used in [27] DSM-IV-TR to refer to individuals who manifest an unexpected and severe difficulty in learning to read. This term does not apply to individuals who had once learned to read but lose this ability due to head injury or other disease.

Dyslexia is a specific learning disability that is a neurodevelopmental in origin which gets expressed from the early schooling period.

Learning to read presents as a considerable obstacle for 4-10 % of the children in normal classroom (Mann and Brady, 1988)[74]. Mercer and Mercer 1985, report about 10-15% of the general school population experience difficulty in reading. Two studies done by Sheldon & Carnillo (1952) and Carrillo (1976) showed the environmental differences in reading problems. Retarded reader has background of slow development in verbal skills, speech defects and motor skills.

A study done by [11] Rozario 1991, indicated that 25 children studying in fourth standard English Medium schools, identified by teachers as poor readers were poor in recognizing simple common words and were not able to exploit the system of phonics. Remedial programme

which concentrates on improving their basic sight words and phonic skills everyday for 15 minutes improved their reading skills to some extent.

Associated Problems

From a clinical perspective, it is useful to understand that reading problems are common in psychiatric disorders, particularly in ADHD and conduct disorders. Epidemiological and clinical studies suggest that the overlap between RD and ADHD is greater than expected by chance.40 percent of children with ADHD also meet diagnostic criteria for RD[68], but the major link appears to be between the inattention dimension of ADHD and RD. However, the strongest link is between the dimensional trait of inattention and reading problems: Inattention, particularly as rated by teachers, is a strong predictor of subsequent reading skills and also predicts a poor response to evidence-based reading

Risk factors

- Family history of RD (particularly in first-degree relatives).
- Developmental history of delayed language development.
- School reports of persistent difficulties in learning to read.
- Persistent and severe problems in spelling (adolescents, adults)

- Reported dislike or avoidance of reading (adolescents and adults) intervention programs.

2. Specific Spelling Disorder (Dysgraphia)

This is characterized by specific and significant impairment in the development of spelling skills. Spelling is forming of words through traditional arrangements of letters. The ability to spell is essential because it is needed for one to read what is written.

[81] Carpenter and Miller in 1982 found that children who had trouble recognizing words in reading also had poor spelling skills. [82] Ekwall (1985) noted that, phonetic spellers mispronounced phonetically irregular words. So, reading and spelling, writing are intermingled with each other. He finally declared that, spelling problems stem from problems in visual memory, auditory memory, and auditory and visual discrimination.

Common problems in writing are

- Not able to write even short sentences
- Omitting a letter
- Misspelling a word
- Poor paragraph organization
- Not able to take notes

- Fail to start with capitals
- Fails to end with periods

3. Specific Disorder of Arithmetical Skills (Dyscalculia)

Students with learning disorder often have difficulty in mastering arithmetic skills and concepts.

Preschool and primary years - children have difficulty in sorting objects understanding arithmetic language,grasping the concept of rational counting or one to one relationship.

Elementary school period - they have trouble with computational skills, problems with fractions, decimals, and measurements.

In middle and upper grades – they face problems in face value and addition subtraction, multiplication and division.

Secondary school - graded calculations and algebra, algorithms etc.

[83] Ashlock (1982) identified that error patterns in Arithmetic disorder were due to incomplete concept formation. [84] Otto and Smith (1980) found the following principles for remedial education in arithmetic disorder.

They are

- Write specific objectives for specific problems

- Regular practicing
- Provision of concrete learning experiences.
- Motivate children to set goals, ask questions, match the task activities.
- Go by step by step process from easy to difficult, like basic operations of addition, subtraction, multiplication and division by first concrete operations – semi concrete operations – abstract operations.

4. Mixed Disorder of Scholastic Skills

The reading skills, spelling skills and arithmetical skills are significantly impaired in these children

Proposed Causes of SLD

There is no single cause[37] to explain the origin of learning disabilities. Factors involved are,

1. Genetic- Learning disabilities run in families
2. Biochemical – possible chemical imbalance leads to faulty brain functioning
3. Biological
    - Foetal distress,
    - problem of laterality,

- Size of left hemisphere, number of neurons in left hemisphere. Equal hemispheres rather than slightly larger left hemisphere.
- Ectopias
- Hereditary link
- "Lightning" across the cortex rather than in the language centers.
- Scattered activity in right hemisphere rather than focused activity in left hemisphere.

Evaluation

To evaluate SLD we need to assess the Intelligence Quotient and Specific skills for scholastic skills like reading, writing and arithmetic. Diagnosis is based on the presence of a significant discrepancy between the scholastic skills and the intellectual capacity of the individual. The IQ should be above the cut off range for Mental retardation that is 70.

The issue of identification of SLD in Indian context seems more complex as the class room conditions are widely varied and different socio economic factors, bilingualism, multilingualism, non availability of a specific screening tool for teachers, various academic boards with varied level of academic difficulty.

Social skills difficulties, language disorders, attention problems, anxiety disorders, affective disorders like depression and behavioural problems are more common in children with specific learning disorders.

Facilities or provisions available for children with SLD

Children evaluated fully and diagnosed as having learning Disability can avail of certain provisions or facilities extended by various boards of education such as the CBSE or ICSE.

- Extra time for board examinations is available
- Provision of scribes for children with dysgraphia
- Use of calculators in the examinations - dyscalculia
- Selection of optional subjects instead of a subject the student is finding difficult to learn.

Epidemiological studies on Scholastic Backwardness

It is mostly observed that at least 20% of the children in a class room get poor marks – they are scholastically backward. The prevalence of scholastic backwardness in previous studies by [20] MKC Nair et al was 5 – 15 % and one by [1] Shenoy et al estimated it to be 10.38 %. Both the studies defined scholastic backwardness as repeated failures in grades and poor academic achievement securing marks < 35 %. So, when

scholastic backwardness in terms of poor academic achievement is concerned, several Indian surveys in the past two decades have recorded prevalence rates that range from 20 – 50 %.

[31] Kapur, 1985; [11] Rozario, 1988, had an overall prevalence of 32.02% in a sample of 12-16 years old urban school children. [10] Sarkar, 1990 reported prevalence of 29.90 % in a sample of 8 to 12 year old urban school children. [12] Venugopal and Raju, 1988, using a tool specific to learning problems identified a prevalence of 20.06%.

A paper presented by [1] Shenoy et al and Malika et al in 1996, under the title of scholastic backwardness among five to eight year old school going children, 1535 children were screened by their class teachers, of which 10.23% were found to have scholastic backwardness. No gender differences were noticed. The following rates of specific difficulties such as reading, writing and arithmetic were found to be 4.69%, 5.15% and 15.96% respectively.

In that about 26% of the scholastically backward children were also found to have psychological disturbance. In addition, they most often came from families which could not afford basic amenities, had fathers with alcohol dependence, inconsistent disciplining and poor parental interaction. They also had more frequent school changes, tution

attendence and fewer hobbies compared to the scholastically average children.

Epidemiological Data - India

The epidemiological data on the prevalence of SLD in India have been very little done due to many difficulties inherent to Indian settings. There were no prospective longitudinal studies. Much less is known about the prevalence of learning problems and especially SLD as with other childhood disorders like ADHD.

In the year 2003, [4] Suresh and Sebastian stated that, there is limited research in India, and that there is no data to quote about the Indian scenario.

[79] John (1990) in Kerala, in his study has found a higher incidence of learning difficulties among children from rural areas. He has further identified a distinct group of children with SLD among the children who had scholastic backwardness, seen in child guidance clinic at NIMHANS.

In a case control study by [19] Madan Gopal Choudhary in the year 2012 at Bikaner city on specific learning disorders in school going children, the prevalence of Learning disorders was found to be 10.25%, which was higher in males than in females.

The Delivery complications were found in increasing frequency in LD and found more left handedness in family members. In class room behaviour, LD children asked questions less and less frequently answered also. He studied the prevalence of the problem, etiological factors like developmental history and family environment and comorbidities.

In a study done at Chandigarh, India, by [85] Priti Arun et al in July 2013 he tried to identify the prevalence of SLD in school children. It was a cross sectional study done in two phases involving students of VII to XII standard. Among the 2402 students 108 were randomly selected for evaluation, which was done by IQ tests, [32] Malin's Intelligence scale for Indian children and standard progressive matrices, SLD assessment was done by [31] NIMHANS index for specific learning disability Battery. 38 students were found to be having SLD mostly of mixed type giving a point prevalence rate of 1.58%.similar study was done by Philip john[17] [18], shah [16] [15],[21] [22]

SLD 'The invisible handicap' study was done by [86] Sunil Karande Mumbai, and prevalence was found to be 12%.

[3] In a large epidemiological study done in Bangalore, screened various psychiatric diagnosis using various validated and standard tools. More than half of the incomplete evaluations were because of lack of co-operation due to long time being taken for testing in specific learning

disabilities. The SLD battery identified 149 (9.4%) children as having scholastic problems

Slum: 9.0%;

Urban: 6.6%

Rural: 11.7%

Of them, 114 (7.2%) did not have any other primary psychiatric diagnosis but did poorly only on the SLD Battery. It was not possible to diagnose them as having SLD, as per [26] ICD-10-DCR criteria, as most of them lacked adequate schooling, and was not included in the calculation of total prevalence.

[7] Philip John in 2014, reported in a review article his experience at Cochin that most of the children assessed for PSP (Poor School Performance) unusually has high degree of co existence of most of the developmental disorders together and thus giving a spectrum –construct.

Epidemiological Data – other countries

While reviewing the literature in other countries, Rosana Bin Awang Bolhasan et al, studied the prevalence of SLD, using the "Dyslexia Screening Instrument".

[74] Kathryn B. Choon et al (1994) designed this rating scale to describe the cluster of characteristics associated with dyslexia and to differentiate between students who display these cluster and students who do not. They took 250 learning disabled students and studied the various socio demographic characteristics such as Age, Parents Educational Status and Occupation, Number of siblings, hierarchy in the Family etc.

[74] Herman (1959) published the oldest follow-up of reading disabled children. He reviewed 72 Danish backward readers – and found that the average reading ability was 6^{th} level. 50% held skilled jobs. But the study did not have a control sample. In Carter's study (1964), 66% of 35 boys had persisting poor reading. Most had lower educational and occupational outcome.

In U.S.A, the incidence of SLD in school children is found to be between 5.3-11.8.[14],[13]

[25] Barbiero et al, showed that, among 1774 8-10 years old children recruited, the prevalence of dyslexia ranged from 3.1% to 3.2%in an Italian study.

[23] A German study, Prediction of learning disability at school by means of SOPESS, by Daseking et al, in 2011, found the prevalence of SLD in the range of 1.1% - 3.0%.

An African study, [24] showed that among the 22.4% of children identified by their teachers as learning problems, 8.7% had physical or mental handicap.

Demographic factors

Although previously it was believed that dyslexia affects boys primarily, recent data indicate that boys and girls are affected equally. The earlier male preponderance has been attributed to a referral bias in school-identified children.

It has been well recognized that children from Low socio economic status families have higher chances of poor school performance.

[1] Shenoy et al in a cross sectional Study involving 1535 children studying in five schools in Bangalore proved that families which lacked basic amenities like Water Supply, Electricity and drainage had a high risk of scholastically backward children.

[74] Study of Sethy et al revealed high drop-out rates of children in Bombay slums, and, attributed it to the deficiency of Iodine. A Study by Kanawada T et al also revealed that presence of high noise adversely affected the health of the child, which in turn affected the School performance. He also proved that noisy unstimulating homes and poor economic conditions lead on to poor school performance.

Family Issues

In the study by [20] MKC Nair et al Multi variate analysis showed the following predictor variables for poor school performance: low education status of the mother, poor concentration in studies, lower study habit rating score scale, lower education of the father and unhappy family, not studying daily lessons.

[1] Shenoy et al in his study observed that alcohol consumption by the father, poor parental interaction, inconsistent disciplining by the parents were high risk factors for scholastic backwardness. Family environment not conducive to learning, lower education status of parents, poor attitude towards studies and personal distractions all contribute to academic performance in children in India.

Cognitive performance is affected by malnutrition due to poverty along with low education and status of parents adversely affect their scholastic performance. Such children also experienced, right from pre-school years, have parents who do not motivate them to study and an unsatisfactory home environment which does not encourage them to study and an unsatisfactory home environment which would never encourage learning (witnessing domestic violence, family stressors and adverse life events).

Sociocultural Issues

[1] Shenoy et al in his study made an observation that increased school changes, lower frequency of private tuition and decreased hobbies were risk factors for poor scholastic performance. In children and even in adolescents he reported that television viewing is associated with poor educational achievement.

Excessive television viewing in childhood resulting in long-lasting adverse consequences for educational achievement and subsequent socioeconomic status and well-being was described in a study on 1000 American children by Robert Hancox et al.

Breakfast plays an important role of in promoting acute cognitive improvements, but also improves outcomes such as school performance.

Psychological aspects of scholastic problems

Academic stress on developing child's brain can lead to various psychological and psychiatric problems in them. It can cause poor self esteem and can cause adjustment disorders as well as somatoform disorders, particularly in older children. These children present with many physical symptoms like headache, chest pain, back pain, stomach ache, vomiting, breathing difficulty, giddiness etc, when they become anxious regarding exams and academic performance. All investigations

will be normal. These symptoms will subside only if the stress is managed through scientific guidance.

'Psychological and Family Problems Associated with Learning Disabilities: Assessment and Intervention' a study done by [42] Larry B Silver et al 1988, showed that learning disabilities not only affect the academic tasks, but also interfere with all stages of psychosocial development as well as with peer and family interactions.[37] [34]

'Behavioral distinctions in children with reading Disabilities and / or ADHD' by [43] Stewart Piescco et al in 1996, found that, children with RD and ADHD exhibit either a pervasive or situational presentation of behavioral problems.

[35] Mukerjee, Hirisave & Kapur in 1995 examined anxiety and self-esteem in scholastic backward children with SLD. 40 children of 8-13 years, with IQ above 80 were given MISIC, NIMHANS index of SLD, State - trait Anxiety inventory, and culture free self-esteem inventory for children. They reported that SLD children had significant scores on state anxiety not trait anxiety scores, and low parental, academic and general self-esteem.

[8] Lall, Hirisave, 1997, analyzed perceived peer relations and social competence in scholastic backward children. Results revealed that

these children were poorer in social competence and in dimensions of, affiliation academics and popularity qualities.

[40] [41] Kappelman et all analyzed 100 children attending learning disability clinic and grouped them into two broad categories-neurological handicaps (33%) and functional disorders (35%).[8

[78] Bhola et al 2000, studied self-esteem and self perception in SLD children, found child's perception of learning difficulties had significant positive associations between academic, social, general, and total self esteem levels, but not significantly associated parental self-esteem.

Behavioral problems in scholastic skill difficulties, studied by Hirisave and Shanthi (2002) revealed that greater amount of internalizing, externalizing behavioral problems in them.[35]

Internalizing and externalizing syndrome in reading and writing disorders by [88] Backer et al, 2003, a German Study, used CBCL – Child Behavior Check List, and identified more internalizing, externalizing behavioural problems and psychiatric diagnosis in 66.2%, most frequently adjustment disorders, followed by hyperkinetic disorders and Anxiety.[36] [38]

Behavioral and emotional problems of students with learning disabilities serious emotional disturbance, a study by [65] Handwerk et al, 1998, investigates LD/ SED (Serious Emotional Disturbance) using Teacher's report form of child behaviour check list, compared both groups, found that the children with LD differ from those with SED especially in severity of problems, not with individual subtype of CBCL.

[58] Kohli, Malhotra, Mohanty, Khehra 2007, studied 46 children 7-14 yrs with NIMHANS SLD battery, reported behavioural problems in 60.9%, history of developmental problems in 39.1%, neurotic traits in 54.3%, family history of learning disabilities in 17.4%.

Behavioural problems in children with dyslexia, by [89] Heiervang, Stevenson, 2001, studied the association between behavioural problems and dyslexia. They recruited 25 dyslexic children 10-12 years old, and matched control group by screening in primary schools in Norway. They used child behaviour check list TRF – Teacher Report Form and YSR – Youth Self Report filled by teachers, parents and children. Study revealed that the dyslexic group had higher behavioural problems compared to control with higher scores on CBCL TRF and total behavioural problems.

A similar study by [90] Barkauskiene et al, reported that the children with learning disorders had more internalizing (somatic

complaints like isolation, anxiety or depression) and externalizing problems (aggression or delinquency) as well as social and attention problems.

A clinical study on Learning Inhibition by [44] Goviind Bapna in 1976 anxiety, aggression, stubbornness and temper tantrum were more in scholastic backward children. He reported that even constitutional and genetic vulnerabilities are of course present, if the environment is supportive and conducive these children could perform reasonably well.

Behaviour disorders of childhood and adolescence by [45] Suman Khurana et al 1980, identified the following behaviour pattern clusters: Monosymptomatic anxious, Unsocialized Aggressive, Regressive and Aggressive. Learning problems also has fallen into first and last cluster.

Neuropsychological aspects of learning problems

In 2003, [74] Bhasi, Oomen, Rao, found that neuropsychological intervention is effective in children with SLD.

[33] Kohli, Mohanty and Kaur, Malhotra, 2006, compared the pattern of deficits, IQ, neuropsychological profile of 45 LD children of 7-14 yrs age. NIMHANS index for SLD and [32] MISIC – Malin's intelligence scale for Indian children, PGI memory scales were used. The results showed greater deficits in mixed groups than writing group in

incorrect use of capital letters. IQ and PGI memory scores were also low in mixed group, revealed that subtypes of SLD may have different neuropsychological profile.

[33] [71] Kohli, 2005, assessed the SLD children in PGIMER, Chandigarh, with battery of neuropsychological tests consisting of PGI memory scale, Wisconsin card sorting test, Bender Gestalt visuo motor test and MISIC. Study revealed deficits in specific areas of memory, executive functions, perceptuo motor tasks.

[33]Vinod Kumar, Bhasi, 2009, matched groups of adults with history of SLD using WAIS III. Results showed significant difference in full scale, verbal and performance IQ, with normals obtaining higher scores. Analysis also showed significant difference in processing speed, verbal comprehension, perceptual organization, and working memory.

[34] Karande, Kulkarni, Sawant analyzed the cognitive abilities of SLD children with different non verbal IQ and concluded that there was similar cognitive abilities even with different range of non verbal IQ from normal, average normal, Bright Normal & Average.

Schuchardt et al, 2008, assessed three sub components of working memory as described by Baddeley, phonological loop, visuo-spatial sketch pad and central executive, using extensive test battery. Results

were children with dyscalculia showed deficits in visuo-spatial memory, dyslexia show deficits in phonological and central executive.

[67] Vasic et al, 2008, indicates deficits in phonological working memory and executive functioning in SLD group. He investigated this by using event related fMRI and a parametric WM task which is needed for use of verbal material. fMRI further provide evidence for functional differences in cortical regions associated with processing of language and executive function in SLD.

[56] [57] Beneventi et al, 2010, studied cortical activation in relation with the working memory in dyslexic and normal readers. aged around 13 years and used a modified WM n – back task, executive working memory processes in dyslexia, wherein the children were asked to remember the first and last speech segment (Phonemes), names of the common objects shown as picture and reported specific working memory deficits in SLD.

SLD sub type of reading disorder is primarily associated with a phonological processing deficit. However the clinical manifestation also induces a reduced verbal working memory span. So, in order to identify whether the this WM deficit is due to the phonological deficit or a distinct WM deficit, Herald [56] [57] Beneventi et al did an fMRI study in 2009. Children with reading disorder showed a reduced activation in

left precentral gyrus compared to control group in letter probe task, and reduced activation of prefrontal cortex and superior parietal cortex in sequence probe task.

[66] Tercy MP et al in 2013 analyzed in depth about the actual working memory impairment in SLD. The author used item and order retention processes to achieve a better understanding of short term memory deficits. STM for item information mainly depends on underlying phonological representations. STM for order information depends on core STM processes which are independent from language processing. The fact that adults with reading disorders manifest a deficit in core verbal STM processes was proved by this study.

[53] [54] Martinez Perez et al in 2012, studied the contribution of short term memory for serial order to early reading acquisition, by a longitudinal study. Similar study was done by Kibby in 2004.

Co –morbidity

Conditions like conduct disorders, hyperkinetic disorders and SDDSS had high degree of inter relatedness. The co morbidity is very well documented in various studies [73] [61] [62] Every third child with conduct disorder will have specific reading disorder [19].

Attention deficit hyperactivity disorder, oppositional defiant disorder, mixed disorders of conduct and emotion, and emotional disorders, separation anxiety disorder, social anxiety disorder and sibling rivalry disorder had high association of scholastic backwardness and very well documented in various studies. [41] Kappelman et al analyzed 100 children attending learning disability clinic and grouped them into two broad categories- neurological handicaps (33%) and functional disorders (35%).[8]

Reading Disorder

Attentional problems, disruptive behaviour disorders, and depressive disorders, are more common in SLD children, particularly older children and adolescents. Data suggest that up to 25 percent of children with reading disorder also have ADHD. Conversely, it is estimated that between 15 and 30 percent of children diagnosed with ADHD have a learning disorder. Although these disorders frequently occur concurrently, they are distinct conditions and require separate interventions. Family studies indicate, however, in some cases, ADHD and reading disorder may be genetically transmitted together. That is, some common genetic factors are producing both reading disorder and attentional syndromes. Some evidence also suggests that higher than random incidence of aggressive behaviour is present in young children

with reading disorders. It appears that in samples of children and adolescents with conduct disorders, reading disorder was more frequent than expected. .

Mathematics Disorder

Mathematics disorder is commonly found comorbid with reading disorder and disorder of written expression. Children with mathematics disorder may also be at higher risk for expressive language disorder, mixed receptive-expressive language disorder, and developmental coordination disorder.

Disorder of Written Expression

Children with writing disorder are at higher risk for a variety of other learning and language disorders, including reading disorder, mathematics disorder, and expressive and receptive language disorders. ADHD occurs with greater frequency in children with writing disorders than in the general population. Finally, children with writing disorders are believed to be at higher risk for social skills difficulties, and some go on to develop poor self-esteem and depressive symptoms.

[86] Sunil Karande et al, 2013, studied the psycho educational profile of children with SLD and ADHD and reported that ADHD occurs in 20% of children with SLD.

[68] Jyothsna Akam Venkata, 2013, in a study, reported the prevalence of ADHD as 11.33%, comorbidity of reading difficulty in 15.27%, writing difficulty in 15.27%.

[63] Erik G Willicutt et al supported that reading and arithmetic disorders had shared deficits in processing speed, working memory, and verbal comprehension. But what they observed was, reading disorders had deficits in phoneme awareness and naming speed, and math deficits were uniquely associated with deficits in set shifting. These results supports multiple-deficit neuropsychological models and suggest that RD and MD are distinct but related disorders that co-occur because of shared neuropsychological deficits in, processing speed, working memory and verbal comprehension.

[74] Krishna, Rao, Oomen 2008, examined relationship between academic skill deficits, brain dysfunction as neuropsychological deficit and psychological comorbidity in the form of behavioural and emotional problems in III to VII std English medium schools. Those children with both academic and neuropsychological deficits had behavioural / emotional problems, which was non-specific to the type of academic skill deficits. The correlation between all three domains was seen by the formation of 3 clusters with distinct profiles of academic skills deficits, neuropsychological deficits and behavioural and emotional problems.

Literature review shows that though many studies on Learning Disability exists, there is no uniformity in them due to - difficulties ranging from the definition of LD, identification and assessment an there exists no specific protocol for the School Teacher or the School Health Cell to facilitate them to screen the Scholastic Under-achievers and provide them appropriate guidance. There is no uniform methodology to evaluate scholastic backwardness

STUDY JUSTIFICATION

Review of the literature definitely proves that there were many Indian studies exist, on Scholastic backwardness, and the prevalence of Specific Learning Disability as a cause of scholastic backwardness. Moreover definite markers of Learning Disabilities have not been established in the regional languages of India.

Role of Language

Transparent language (Tamil) vs Opaque language (French, English)

Alphabetical language (Tamil, English vs Character language (Chinese, Japanese)

This needs extensive discussion as research workers have understood transparent languages have easier phonological processing which is the key central factor in the causation of SLD.

The study of scholastic backwardness and specific learning disorders in Tamil is very limited and moreover the tool for assessment of SLD is available in English and Kannada only. Also, evaluation of SLD involves assessment of Intelligence Quotient – which is a very extensive and laborious affair.

About 10-15% of children have variation in neural circuits, during brain formation in Intra uterine life. These neural circuits are related to decoding a written word (Grapheme) processing it and production of sound (phoneme).

This difficulty comes to parents and teachers notice when the child reaches the late primary schooling.

If we identify these children earlier and give remedial education they would improve. We can provide certification for their invisible disability, so that they can have the various benefits.

AIMS AND OBJECTIVES

Primary Objective

To compare Scholastic Performance and to find its relationship with behavioural and emotional problems in children.

Secondary Objectives

- To compare the socio demographic profile and other related factors with learning problems.
- To find children with specific learning disorders.
- To find correlation between scholastic performance and verbal working memory.

Hypothesis

1. Specific learning Disability is one of the important causes of Poor Scholastic Performance.
2. Children with Specific Learning disorders have more internalizing and externalizing behavioral problems.
3. Verbal Working Memory is impaired in children with Specific Learning disorders.
4. Verbal and Performance IQ discrepancies are seen in children with Specific learning disorders.

METHODOLOGY

Approval from Institutional Human Ethical Committee (IHEC) was obtained before conducting the study. This is a cross sectional comparative study conducted in primary school children.

Inclusion Criteria

Students of class IV & V in Corporation Primary Schools, attached to ICH School Health Program, Egmore, Chennai

Exclusion Criteria

- Mental retardation.
- Any chronic medical illness causing frequent absenteeism, sensory and neurological abnormalities
- Visual, hearing and speech impairment.
- Muscular dystrophy
- Cerebral palsy
- Cognitive delay
- Epilepsy.

Sample Size and Selection of Sample

Institute of Child Health, Egmore, Chennai has a School Health Team. It covers the school health activities in Government, corporation, Government Aided schools in and around the Egmore.

Permission Obtained from DC education and written order from E.O Educational Officer, Corporation Schools, Chennai Corporation. Permission also obtained from Institute of Child Health school health programme and Director, ICH.

There were 162 schools attached to ICH school health programme. Among them 69 were Government aided schools, 39 were either Boys or Girls schools which were not taken, leaving behind 54 co-education Corporation schools.

Assuming the prevalence as 10% from previous literature, and 95% confidence interval and relative error of 15 per cent the sample size was calculated. For which about 9 schools are needed. Among the 54 schools 9 schools were randomly selected by simple random sampling.

Total No of children in 4^{th} and 5^{th} standard 362. After applying the exclusion criteria, 30 students were excluded & the remaining 332 children were stratified into two groups, Scholastically Average average

and Scholastically backward below Average based upon the average marks in Formative assessments.

In SABL & SALM, the following grades were given to children according to the marks they score in formative assessment Examinations.

A1 91-100

A2 81-90

B1 71-80

B2 61-70

C1 51-60

C2 41-50

D 33-40

E1 21-32

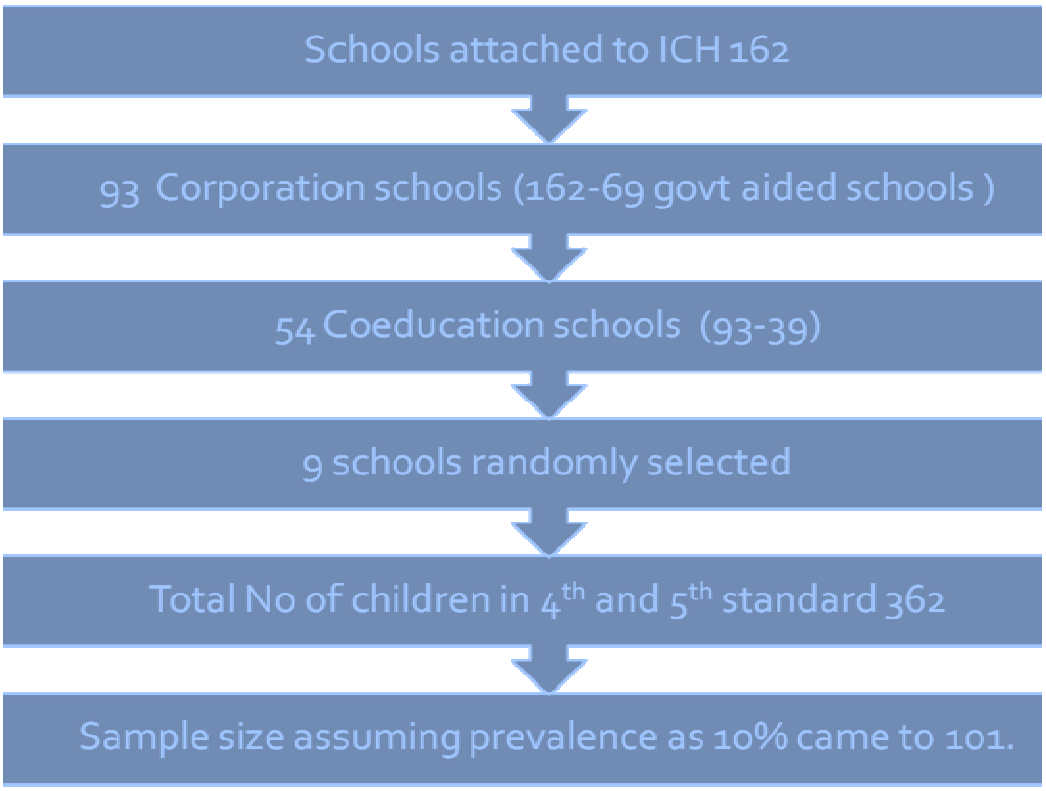
E2 < 20

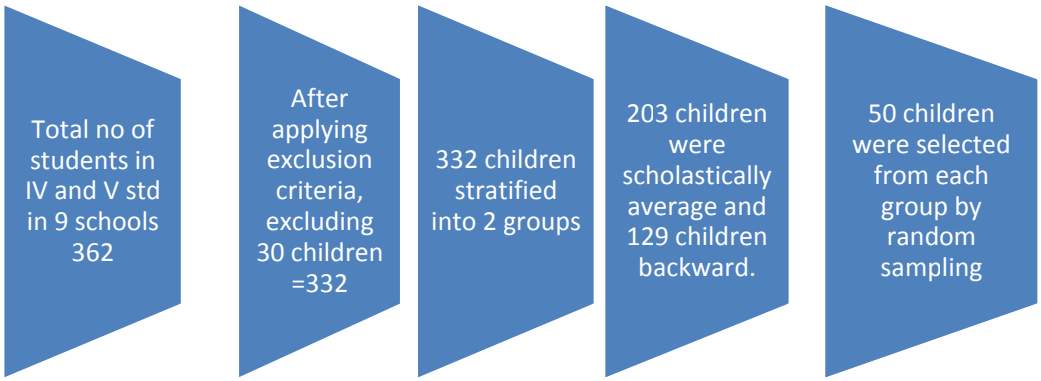
Scholastic Backwardness is operationally defined in terms of poor academic performance as reflected by overall marks below 50%. The students who have had grades C2, D, E1,E2 were taken as scholastically backward and the other children who had grades A1 A2 B1 B2 were taken as scholastically average.

Among the 362 children fourteen students were absent for long time and nine students had mild to moderate intellectual disability, two students had hearing impairment, three students had Epilepsy, one student was a known case of Nephrotic Syndrome on treatment and another student had congenital heart disease. Excluding these 30 children the remaining sample had 332 children.

The remaining 332 children were divided into 2 groups based on their grades, the scholastically average group had 203 children and scholastically backward group had 129 children. Then from each group about 50 students were randomly selected by using random number tables.

SAMPLING


Schools attached to ICH 162
93 Corporation schools (162-69 govt aided schools)
54 Coeducation schools (93-39)
9 schools randomly selected
Total No of children in 4th and 5th standard 362
Sample size assuming prevalence as 10% came to 101.


Total no of students in IV and V std in 9 schools 362
After applying exclusion criteria, excluding 30 children =332
332 children stratified into 2 groups
203 children were scholastically average and 129 children backward.
50 children were selected from each group by random sampling

MATERIALS

1. Semi-structured proforma for socio-demographic and family characteristics:
    1. Age
    2. Sex
    3. Father
        - Alive / dead, Education, Occupation & Alcoholic or not.
    4. Mother
        - Alive/ dead, Education & Occupation
    5. Who teaches the child at home
    6. TV viewing habits
    7. Attendance
        - Regular
        - Frequent Absenteeism – Absent for more than 5 working days a month for consecutive 2 months.
2. Child Behaviour Checklist (ASEBA School Age Forms)
3. Malins Intelligence Scale for Indian Children (MISIC)
4. Specific learning disability (SLD) battery
5. Seguin Form Board Test (SFBT)
6. N-Back Test

Child Behaviour Checklist (CBCL)

The Achenbach System of Empirically Based Assessment (ASEBA) helps professionals from various backgrounds to quickly and effectively evaluate diverse aspects of adaptive and maladaptive functioning**.**

In 1991, this was introduced cross-informant syndromes that provide central foci for systematic comparisons of data from parent, teacher, and self reports and important new advances are being made in the integration of parent, self, and teacher reports, including more items that have counterpart.

1. Both the CBCL and TRF now span ages 6-18.
2. The scoring scales are based on new national samples.
3. Syndrome scales have been revised on the basis of new samples that were analyzed via more advanced factor analytic methodology designed to coordinate CBCL, YSR, and TRF scales.
4. DSM-oriented scales have been constructed and rated as very consistent with DSM-IV diagnostic categories.

5. The narrative reports now include critical items that were reported for each child.

CBCL for ages 6-18 YSR - Youth Self Report, PRF - Parent Report Form and TRF –Teachers Report Form are available. These are parallel forms which facilitate systematic comparison of various perspectives of children enabling comprehensive assessment.

In this study, the TRF is used which was normed for ages 6-18. The TRF is completed by Teachers who is familiar with children's functioning in the school in the previous 2 months.TRF Requests the respondents to rate behavioural, emotional and social problems as 0, 1 & 2.

To improve assessment of conduct problems and depression, certain questions in CBCL parents form, was changed, and it contains total of 113 questions with changes in item number 47, 49, 53, 59, 60, 67, 72, 73, 76, 77, 81, 92, 98, 99, 100, 106, 107, 108, and 110.

Syndrome Profiles

A syndrome is asset of problems that tend to co-occur. There were 6 such syndrome profiles in CBCL –TRF. They are

1. Affective Problems
2. Anxiety Problems

3. Somatic Problems

    - Internalizing Problems

4. Attention Deficit / Hyperactivity Problems

5. Oppositional Defiant Problems

6. Conduct Problems

    - Externalizing Problems

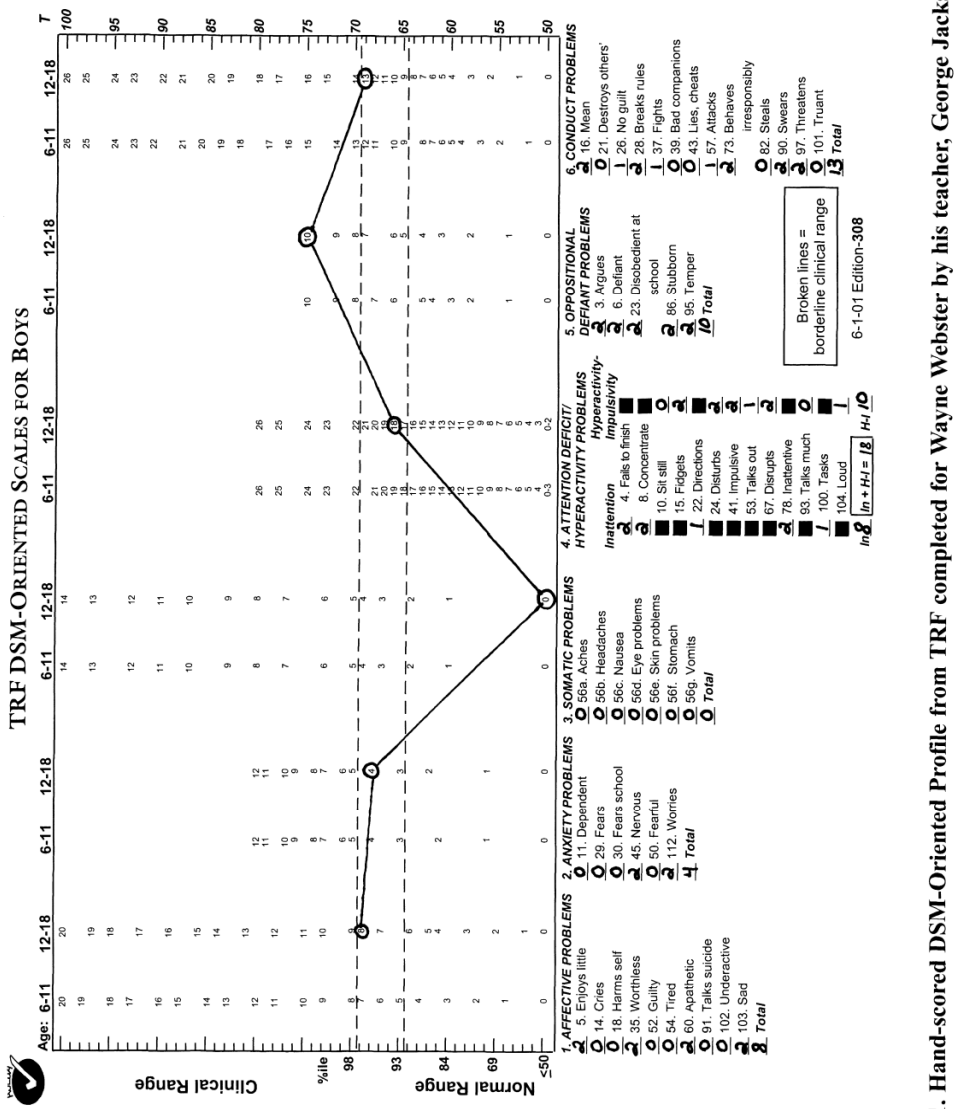


Figure 4-1. Hand-scored DSM-Oriented Profile from TRF completed for Wayne Webster by his teacher, George Jackson.

The competence scores were given in ranges

- Clinical
- Borderline
- Normal

This scale is well validated scale, used in various previous similar studies and has high rater and interrater reliability and internal consistency, test retest reliability and can very well be used for follow up of the child after remedial programmes.

The DSM oriented scales were normed on the national sample as the empirically based scales. The TRF profile of DSM oriented scales compares a child's score with national sample of children.

Relationship between internalizing and externalizing scores

These are not mutually exclusive, but some children can have both kinds of problems. This is analogous with the relationship between IQ scores of WISC, verbal and performance IQ.

Malins Intelligence Scale for Indian Children (MISIC)

An Indian version of Weschslers Intelligence Scale for children 5-15 years by Dr. Arthur J. Malin of Nagpur embraces all the advantages of the original along with some improvements, comprises of both verbal and performance tests.

Verbal Performance

1. Information	1. Picture completion
2. Comprehension	2. Block design
3. Arithmetic	3. Object Assembly
4. Similarities	4. Coding
5. Vocabulary	5. Mazes.
6. Digitspan	

The Indian adaptation omits the picture arrangement of performance scale as it proved culturally biased both as to content and form. Along with English Version two other vernacular versions have been constructed in Marathi and Hindi.

This Indian adaptation has established it's Test-Retest reliability. Unlike the WISC which does not support on any validity except arguing for construct validity, MISIc has both concurrent and congruent validity.

In this scale Raw scores for each subset was obtained and corresponding Test Quotient are obtained from normative tables for particular age, which when added upon and average of each subgroup will give verbal IQ, Performance IQ. Full scale IQ obtained by average of the two.

Specific Learning Disability (SLD) Battery

The Identification of specific Learning Difficulty in Indian context is a difficult issue, because of various medium of instruction, Class room size, no specific screening tool for teachers. The issue is further complicated by various Board of Educational system available in India & Tamil Nadu. In the present study, the Battery was given by the author, to the children in corporation Primary schools, having Tamil as a medium of instruction

This battery of tests called as NIMHANS LD Battery, used to assess attention, reading, writing spelling comprehension, arithmetic, visuo-motor skills and auditory and visual memory was compiled at NIMHANS. This battery has face and content validity.

A diagnosis of SLD was made. If the child's performance was 2 classes below the age appropriate achievement.

This Battery was developed by John (1989) for purpose of her doctoral thesis later routinely used with the children at the child and adolescent mental health unit, NIMHANS for confirmation of SLD. It consists of 2 levels, Level I (5-7 yrs) and II (8-12yrs).

A child who functions at two grades below his age appropriate grade can be considered to have SLD, either in reading, writing, spelling,

arithmetic or mixed. Scale assesses the following domains of Scholastic skills:

a. Reading Skills
b. Reading comprehension
c. Writing Skills & Written Expression
d. Arithmetic skills

Seguin Form Board Test (SFBT)

It consists of a large wooden board from which 10 geometrical shapes are cut. The subject is instructed to replace the blocks in their right places as fast as he can. The trials are given and the time taken is noted. Visuo-motor coordination, and mental speed and performing by insight or trial and errors were assessed by this test.

Verbal Working Memory (N back test)

It is a measure of verbal working memory. Development of working memory starts from refinement of basic perceptual and sensorimotor functions to actual maturation of neural networks that integrate complex processing demands inherent to working memory tasks.

PET studies have revealed two major sites of activation in n back task, particularly, 2 back task verbal working memory task. Activation is observed in the posterior cortex in the left hemisphere, which is said to be

responsible for storage of verbal material. Other areas activated are Prefrontal cortex, inferior frontal gyrus, premotor cortex and supplementary motor area. These activation s primarily mediate internal speech code necessary for rehearsal. The test consists of lists of phonemes. Verbal working memory has three components

1. Storage
2. Manipulation of information
3. Rehearsal.

The test is based on the fact that, the two variables namely Phonemic Similarity and Word length affect verbal working memory.

All the tools were translated into Tamil and back translated to English for ensuring correct translation

STATISTICAL ANALYSIS

The socio demographic categorical variables were compared by χ^2 (Chi-square) test. The continuous variables were related and compared between them by student's T test.

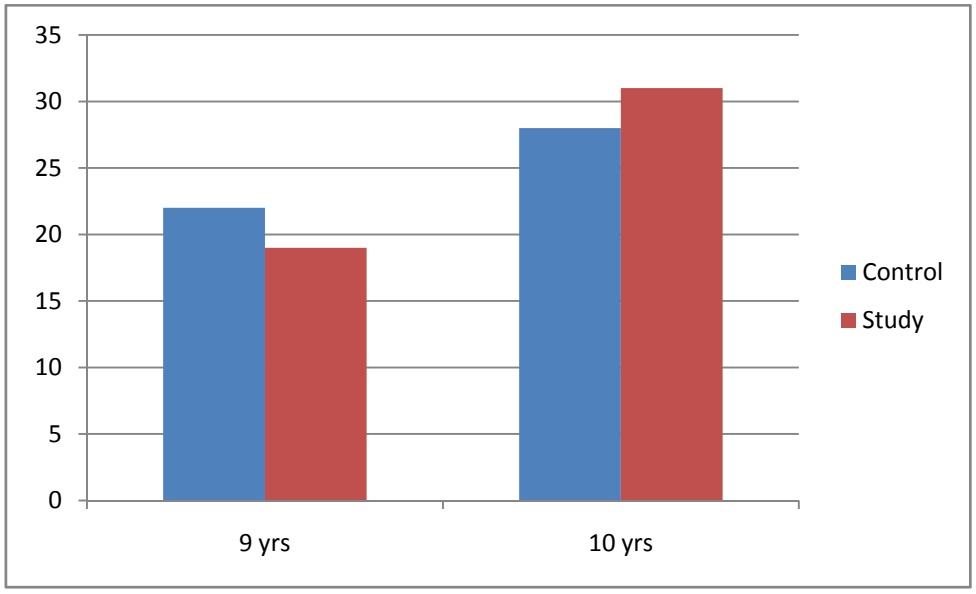
If any continuous variables of more than two groups, ANOVA (Analysis Of Variance) test was applied.

The above statistical procedures were performed by the statistical package namely IBM SPSS statistics-20.

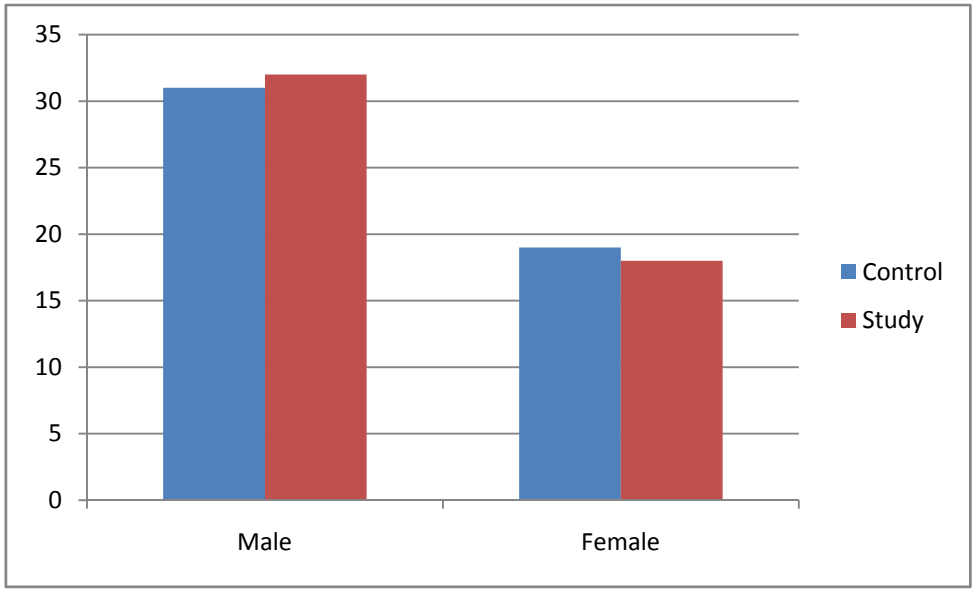
The P- values < 0.05 ($P<0.05$) were considered as statistically significant in two tailed test.

Description of the data

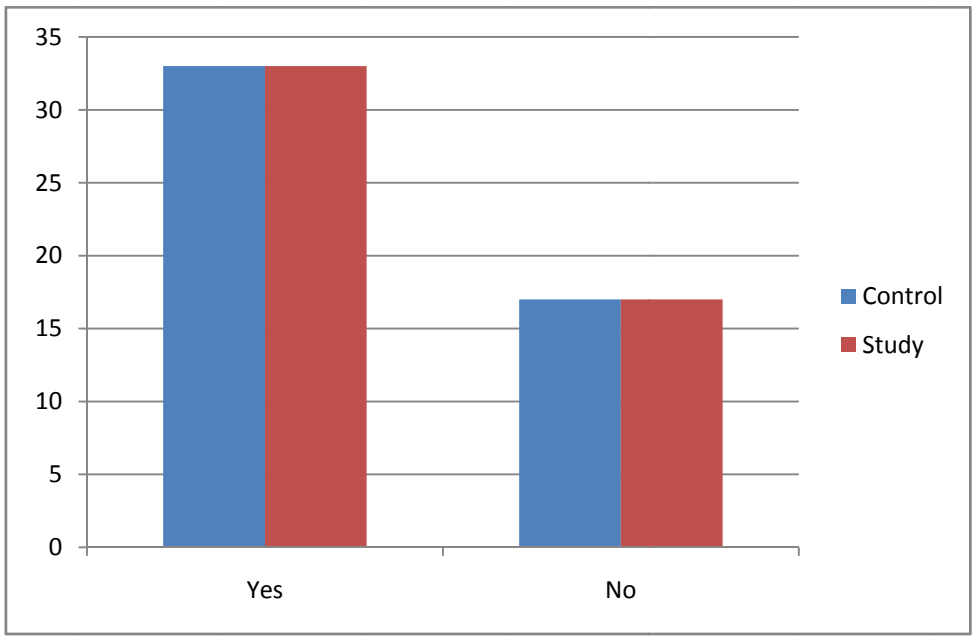
A sample of 100 children studying in IV and V standard were selected. Study group is defined as scholastically backward children (50). Control group is defined as scholastically average children (50).



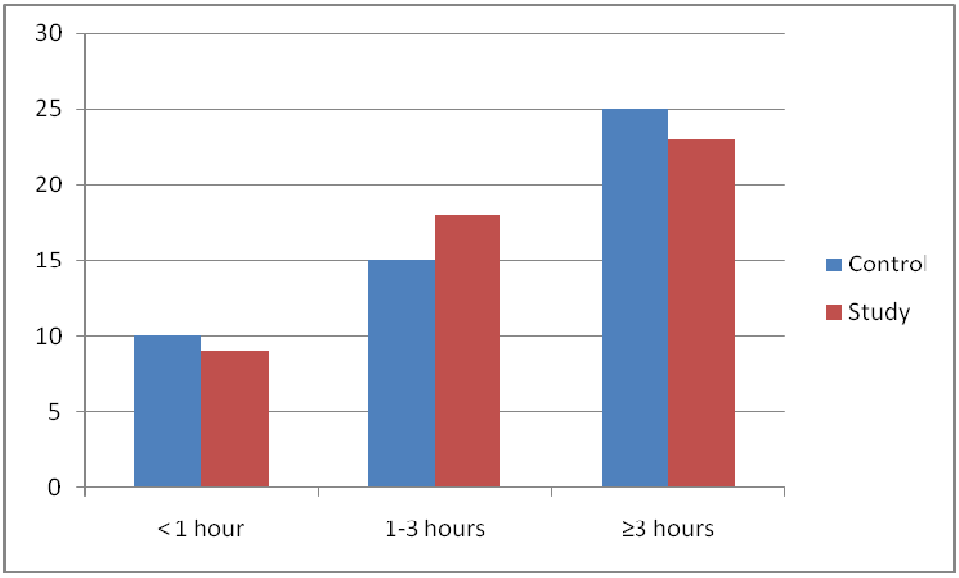
Distribution of age in control and study children



Distribution of gender in control and study children

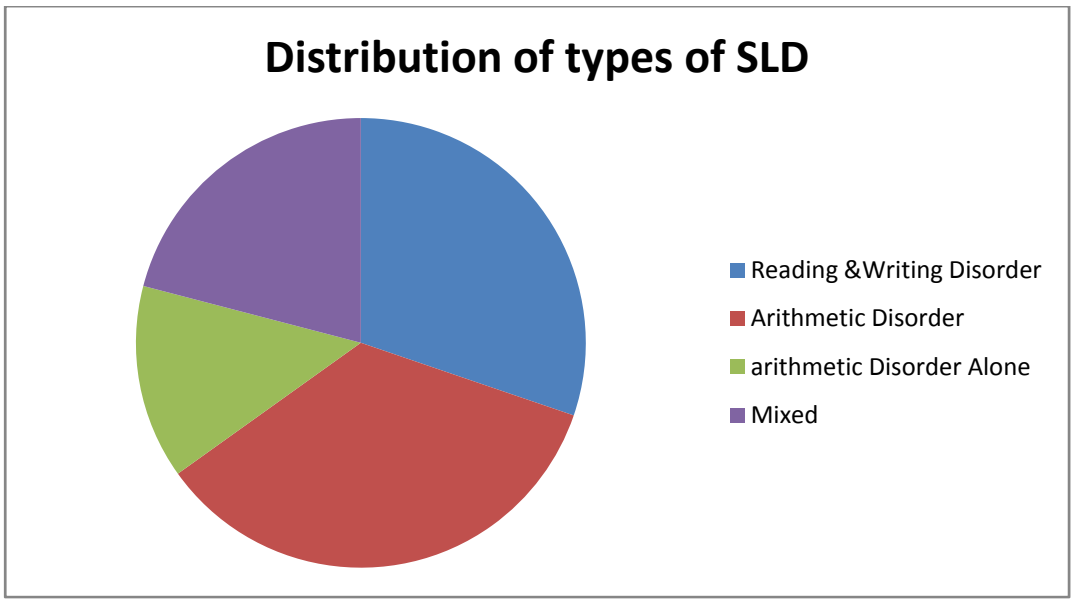


Distribution of father's alcoholism in control and study children



Distribution of TV viewing habits in control and study children

- Among the control group, 28 students were from V std 10yrs, and 12 from IV std 9 yrs.
- Among the study group, 31 students were from V std, and 19 from IV std.
- There were 31 males and 19 females in the control group and 32 males and 18 females in the study group with male children more than female
- Among the study group, 19 students have SLD.
- Reading Disorder and disorder of written expression present in 13 students.
- Arithmetic disorder is present in 15 students, 6 of them has arithmetic disorder alone. Mixed disorder is present in 9 children.
- Among the control group none had SLD.



RESULTS

The results are discussed under the following headings.

1. Comparison of groups by age and gender.

2. Comparison of fathers' demographic characters

3. Comparison of mothers' demographic characters

4. Comparison of child related variables

5. Comparison of behavioural and emotional problems

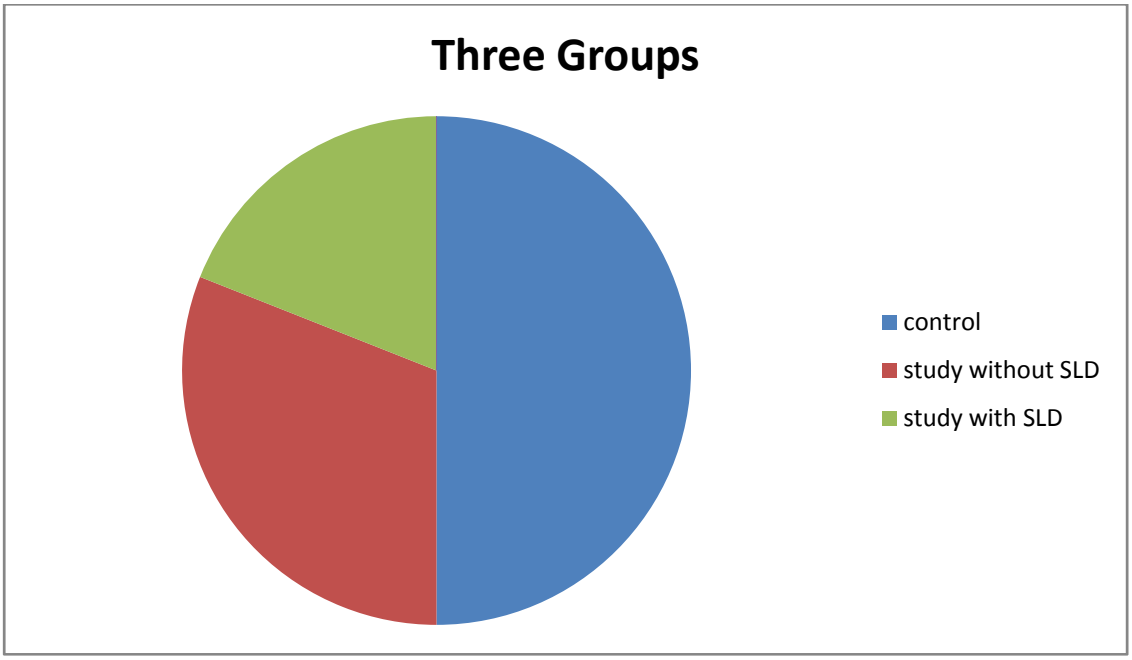
6. Comparison between Normal, Scholastically backward without SLD and Scholastically backward with SLD in the areas of behavioural problems, IQ, SFBT, and Verbal working memory.

7. Correlation between variables in the above three groups.

Description of Sample

The total sample is divided into three groups namely,

1. Control
2. Study without SLD
3. Study with SLD.



Comparison of these three groups in

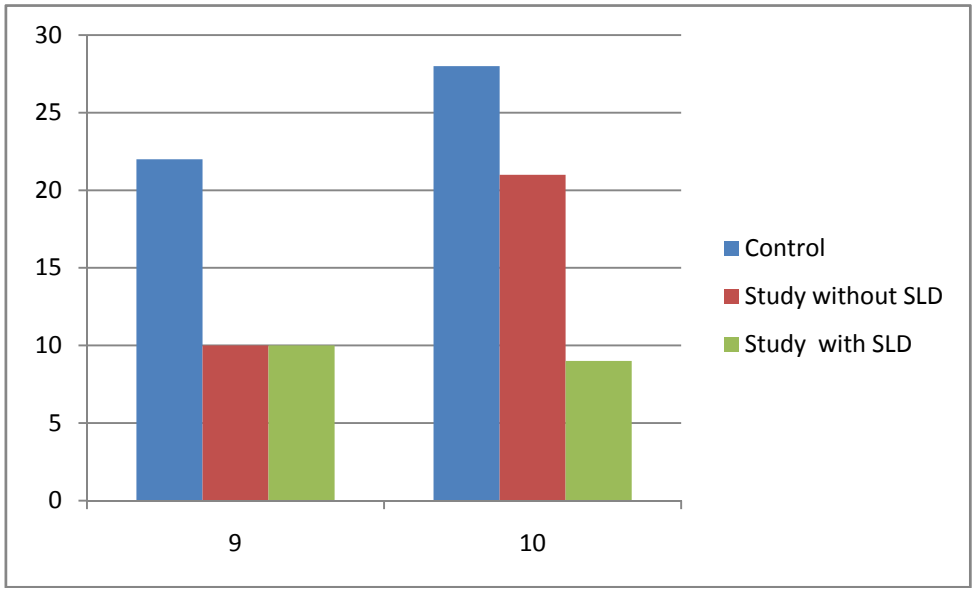
- Age, Gender
- Father's demographic variables
- Mothers demographic variables
- Child related variables

COMPARISON OF AGE AND GENDER :

Group	N	9yrs	10yrs	χ^2	Df	Significance
Control	50	22	28	2.171	2	P=.338
Study without SLD	31	10	21			
Study with SLD	19	10	9			
Total	100	42	58			

Table 1 Comparison of three groups of children according to their age

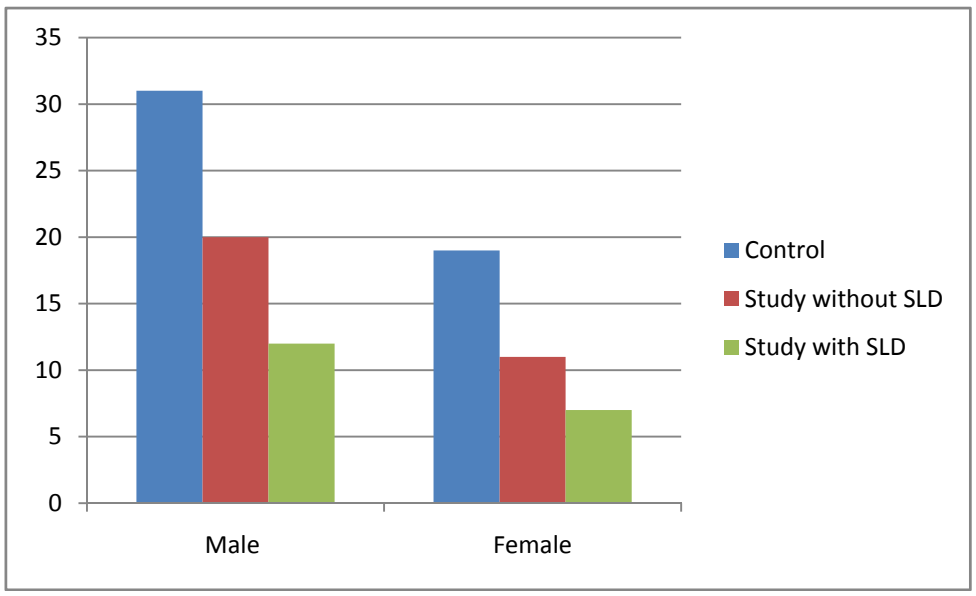
Table 1 Comparison of three groups of children according to their ***age*** compares the three groups according to their ages. The difference between them was not statistically significant (P>0.05).



	Gender		TOTAL	χ^2	Significance
	Male	**Female**			
Control	31	19	50	.052	P=.974
Study without SLD	20	11	31		
Study with SLD	12	7	19		
TOTAL	63	37	100		

Table 2 comparison of three groups of children according to their gender

Table 2 shows the comparison of the groups between the genders. The three groups did not show any significant associations in respect of sex (P>0.05).



Comparison of fathers' demographic characters:

The demographic characteristics of fathers between three group's namely alive status, education, occupation and alcoholism were compared.

Alive status	Sample			Total	χ^2	Df	Significance
	Control	Study Without SLD	Study With SLD				
Alive	47	27	16	90	1.887	2	P=.389
Died	3	4	3	10			
Total	50	31	19	100			

Table 3 Comparison of fathers' aliveness between three groups

Table-3 compares the alive status of fathers between three groups. The results revealed that there was no significant associations between the fathers of three groups in respect of their alive status (P>0.05).

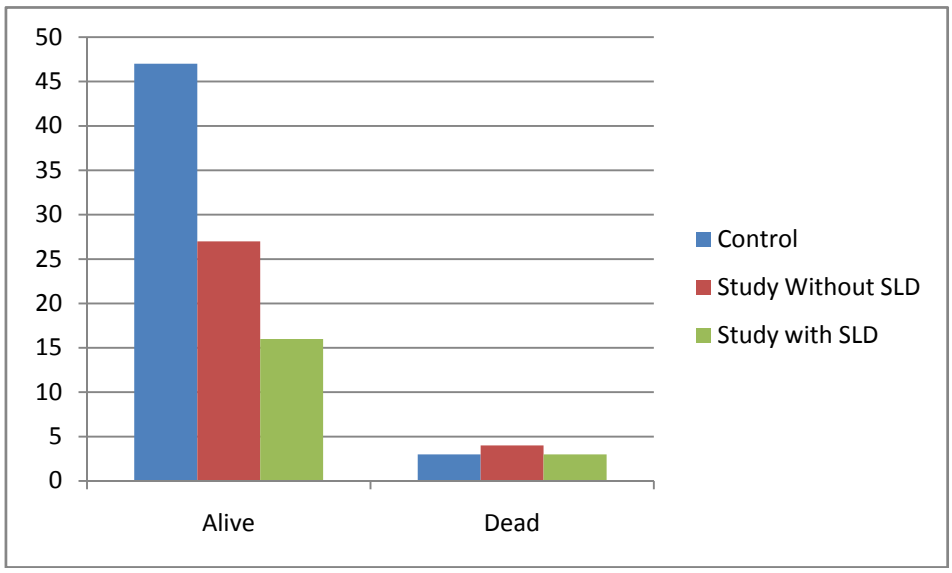


Table-4 Comparison of fathers' education between three groups:

Education status	Sample				χ^2	Df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Illiterate	6	7	1	14	6.556	6	P=0.364
Primary	23	14	11	48			
High school	21	9	6	36			
Hr. Sec +	0	1	1	2			
Total	50	31	19	100			

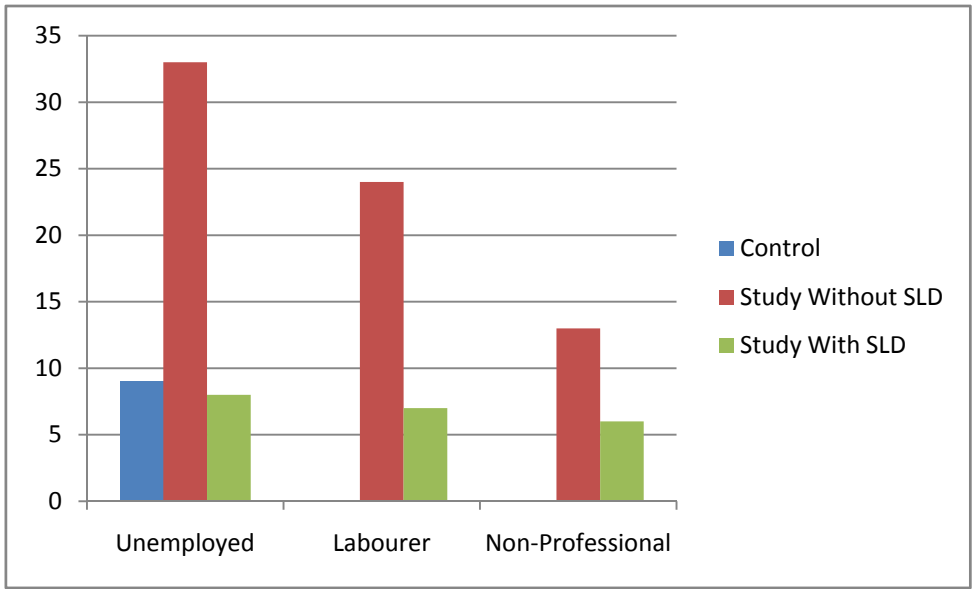
Table 4 Comparison of fathers' education between three groups

Table-4 compares the education status of fathers between three groups. The results revealed that there was no significant associations between the fathers of three groups in respect of their education status (P>0.05).

Occupation status	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Unemployed	9	0	0	9	11.010	4	**P=0.026**
Labourer	33	24	13	70			
Non-Professional	8	7	6	21			
Total	50	31	19	100			

Table 5 Comparison of fathers' occupation between three groups

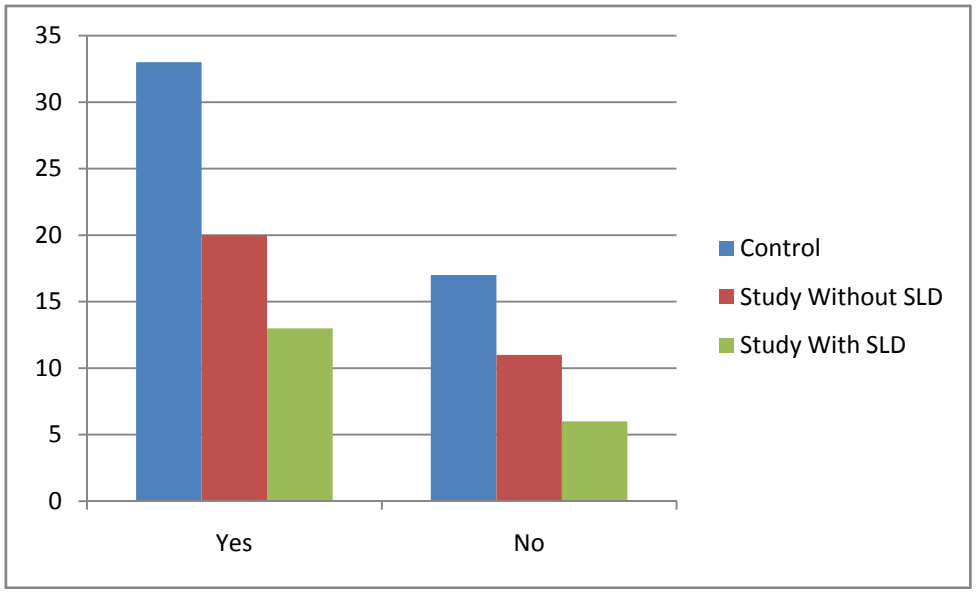
Table-5 compares the occupation status of fathers between three groups. The results revealed that there was significant associations between the occupations of father with three groups (P<0.05).



Alcoholism status	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Yes	33	20	13	66	0.080	2	P=0.961
No	17	11	6	34			
Total	50	31	19	100			

Table 6 Comparison of fathers' alcoholism between three groups

Table-6 compares the alcoholism status of fathers between three groups. The results revealed that there was no significant associations between the fathers of three groups in respect of their alcoholism status (P=1.00).



The demographic characteristics of mothers between three group's namely alive status, education and occupation were compared.

Alive status	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Alive	47	29	17	93	0.454	2	P=0.797
Died	3	2	2	7			
Total	50	31	19	100			

Table 7 Comparison of mothers' aliveness between two groups

Table-7 compares the alive status of mothers between three groups. The results revealed that there was no significant associations between the mothers of three groups in respect of their alive status (P>0.05).

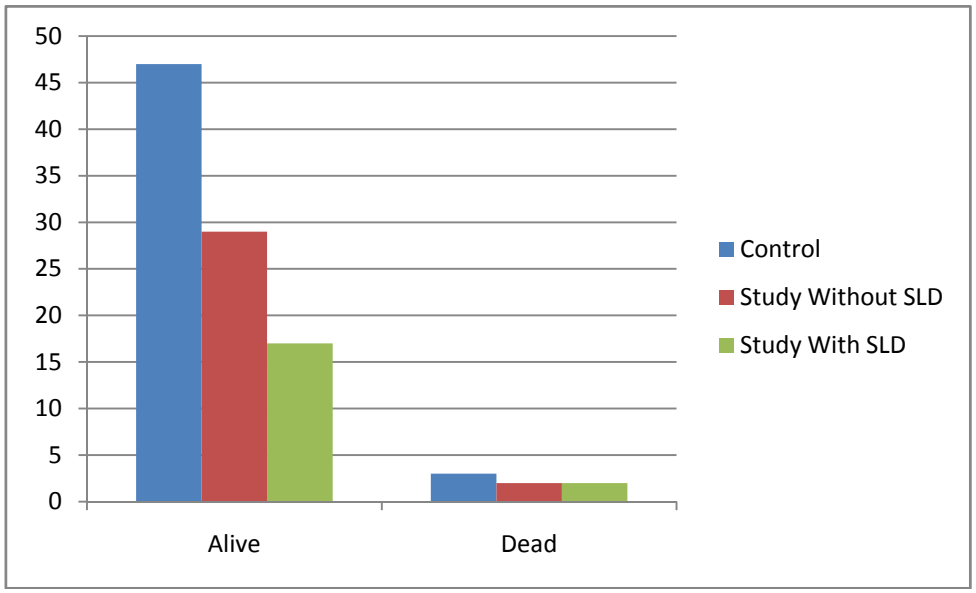


Table-8 Comparison of mothers' education between three groups:

Education status	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Illiterate	8	3	3	14	6.370	8	P=0.606
Primary	23	15	6	44			
High school	19	12	9	39			
Hr. Sec +	0	1	1	3			
Total	50	31	19	100			

Table 8 Comparison of mothers' education between three groups

Table-8 compares the education status of mothers between three groups. The results revealed that there was no significant associations between the mothers of three groups in respect of their education status (P>0.05).

Occupation status	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Un-employed	39	24	17	80	1.320	2	P=0.517
Labourer	11	7	2	20			
Total	50	31	19	100			

Table 9 Comparison of mothers' occupation between three groups

Table-9 compares the occupation status of mothers between three groups. The results revealed that there was no significant associations between the mothers of three groups in respect of their occupation status (P>0.05).

The demographic characteristics of children between two groups such as home teaching, TV viewing and school attendance were compared.

Home teaching	Sample				χ^2	df	Signi-ficance
	Control	Study Without SLD	Study With SLD	Control			
No teacher	8	5	6	19	7.236	8	P=0.511
Parent	9	6	2	17			
Siblings	6	2	3	11			
Grand parents	3	2	3	8			
Tuition	24	16	5	45			
Total	50	31	19	100			

Table 10 Comparison of children's home teaching between three groups

Table-10 compares the home teaching of children between three groups. The results revealed that there was no significant associations between the children of three groups in respect of their home teaching (P>0.05)

TV viewing habit /day	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
< 1 hour	10	1	7	18	11.444	4	**P=0.022**
1-3 hours	15	15	2	32			
≥3 hours	25	15	10	50			
Total	50	31	19	100			

Table 11 Comparison of children's TV viewing habit between three groups

The table-11 compares the TV viewing habit of children between three groups. The results revealed that there was significant associations between the children of three groups in respect of their TV viewing habit (P<0.05).

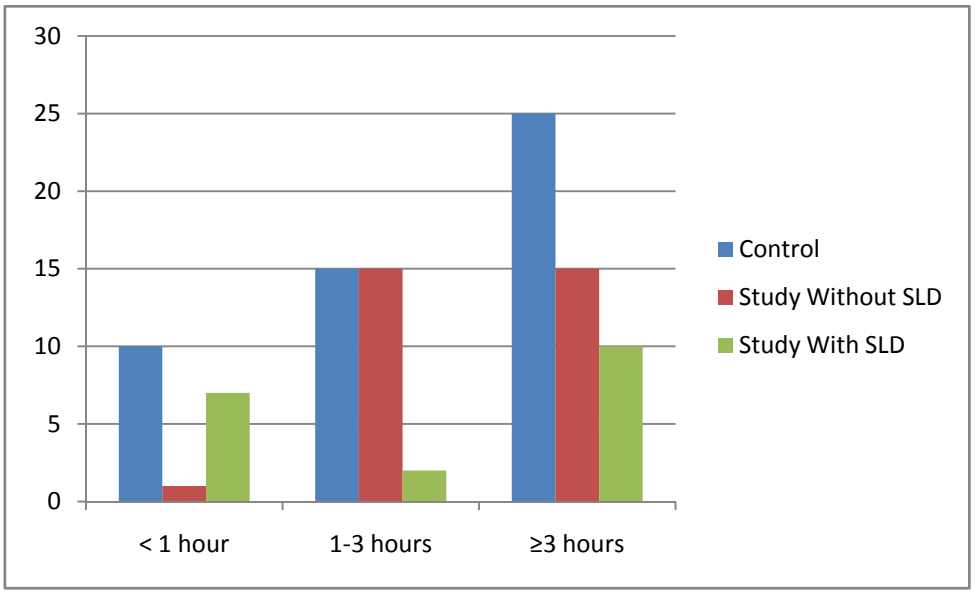
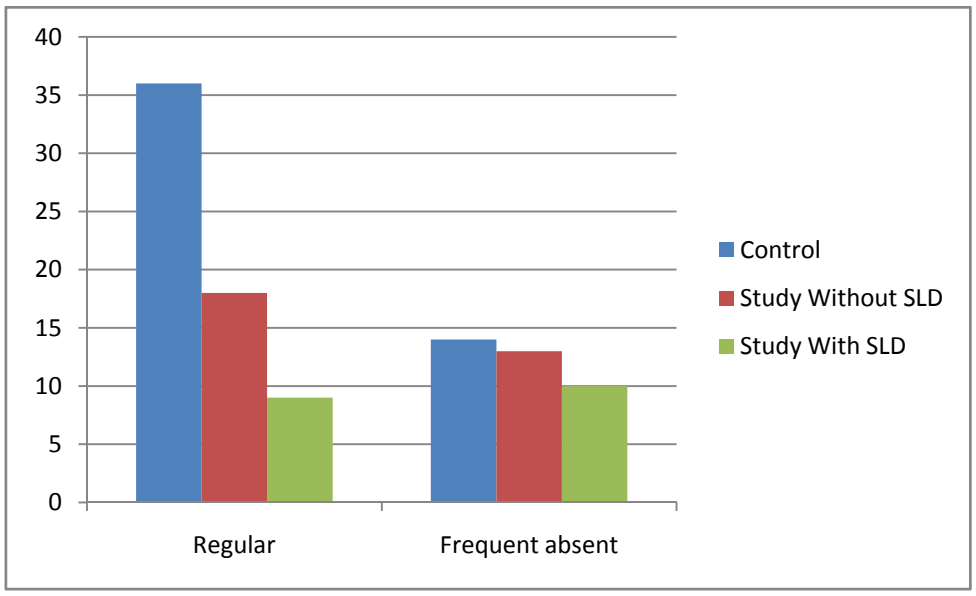


Table-12 Comparison of children's school attendance between three groups:

School attendance	Sample				χ^2	df	Significance
	Control	Study Without SLD	Study With SLD	Total			
Regular	36	18	9	63	4.053	1	P=0.132
Frequent absent	14	13	10	37			
Total	50	31	19	100			

Table 12 Comparison of children's school attendance between three groups

Table-12 compares the alcoholism status of fathers between three groups. The results revealed that there was no significant associations between the children of three groups in respect of their school attendance (P>0.05).



Comparison of IQ Verbal

Descriptives						
Description Of verbal IQ Data in Three Groups			N	Mean	Std. Deviation	Std. Error
General infor	SLD		19	86.42	9.952	2.283
	Non SLD		31	88.39	8.213	1.475
	Control		50	104.14	10.311	1.458
	Total		100	95.89	12.660	1.266
	Model	Fixed Effects			9.641	.964
		Random Effects				6.494
Comprehension	SLD		19	89.00	11.328	2.599
	Non SLD		31	90.19	7.346	1.319
	Control		50	101.60	8.000	1.131
	Total		100	95.67	10.347	1.035
	Model	Fixed Effects			8.534	.853
		Random Effects				4.657
Arithmetic	SLD		19	74.95	11.683	2.680
	Non SLD		31	85.58	9.423	1.692
	Control		50	99.22	8.676	1.227
	Total		100	90.38	13.467	1.347
	Model	Fixed Effects			9.530	.953
		Random Effects				7.508
Analogies similarities	SLD		19	88.47	9.559	2.193
	Non SLD		31	86.65	7.774	1.396
	Control		50	98.60	4.965	.702
	Total		100	92.97	8.919	.892
	Model	Fixed Effects			6.936	.694
		Random Effects				4.443
Vocabulary	SLD		19	77.42	9.929	2.278
	Non SLD		31	81.81	7.918	1.422
	Control		50	91.50	9.639	1.363
	Total		100	85.82	10.853	1.085
	Model	Fixed Effects			9.199	.920
		Random Effects				4.600
Digit span	SLD		19	83.79	11.583	2.657

Verbal IQ

ANOVA COMPARISON		Df	F	Sig
General infor	Between Groups	2	36.858	
	Within Groups	97		**.000**
	Total	99		
Comprehension	Between Groups	2	24.256	
	Within Groups	97		**.000**
	Total	99		
Arithmetic	Between Groups	2	50.358	
	Within Groups	97		**.000**
	Total	99		
Analogies similarities	Between Groups	2	33.357	
	Within Groups	97		**.000**
	Total	99		
Vocabulary	Between Groups	2	20.402	
	Within Groups	97		**.000**
	Total	99		
Digit span	Between Groups	2	28.953	
	Within Groups	97		**.000**
	Total	99		

- The three groups differed significantly both within groups and between groups in all the subsets of verbal IQ.
- The Vocabulary and Arithmetic and digitspan subsets have low scores which contributed to overall low verbal IQ in SLD children.
- Vocabulary, Comprehension & Information subsets which assess the language functions, showed impaired functions in these domains in SLD children.
- Digit span which reflects the attention, immediate memory also impaired in children with SLD.

Comparisons of verbal IQ between three groups.					
Tukey HSD					
Dependent Variable	(I) Scholastic	(J) Scholastic	Mean Difference (I-J)	Std. Error	Sig.
General infor	SLD	NON SLD	-1.966	2.809	.764
		CONTROL	-17.719*	2.598	**.000**
	NON SLD	SLD	1.966	2.809	.764
		CONTROL	-15.753*	2.204	**.000**
	CONTROL	SLD	17.719*	2.598	**.000**
		NON SLD	15.753*	2.204	**.000**
Comprehension	SLD	NON SLD	-1.194	2.487	.881
		CONTROL	-12.600*	2.300	**.000**
	NON SLD	SLD	1.194	2.487	.881
		CONTROL	-11.406*	1.951	**.000**
	CONTROL	SLD	12.600*	2.300	**.000**
		NON SLD	11.406*	1.951	**.000**
Arithmetic	SLD	NON SLD	-10.633*	2.777	**.001**
		CONTROL	-24.273*	2.568	**.000**
	NON SLD	SLD	10.633*	2.777	**.001**
		CONTROL	-13.639*	2.178	**.000**
	CONTROL	SLD	24.273*	2.568	**.000**
		NON SLD	13.639*	2.178	**.000**
Analogies similarities	SLD	NON SLD	1.829	2.021	.639
		CONTROL	-10.126*	1.869	**.000**
	NON SLD	SLD	-1.829	2.021	.639
		CONTROL	-11.955*	1.585	**.000**
	CONTROL	SLD	10.126*	1.869	**.000**
		NON SLD	11.955*	1.585	**.000**
Vocabulary	SLD	NON SLD	-4.385	2.680	.235
		CONTROL	-14.079*	2.479	**.000**
	NON SLD	SLD	4.385	2.680	.235
		CONTROL	-9.694*	2.103	**.000**
	CONTROL	SLD	14.079*	2.479	**.000**
		NON SLD	9.694*	2.103	**.000**

This table shows that the all verbal IQ subsets significantly differed between Control & SLD and Control & Non SLD.

Comparison of Performance IQ (ANOVA) between three groups

DESCRIPTION OF PER IQ IN THREE GROUPS		N	Mean	Std. Deviation	Std. Error
Picture completion	SLD	19	90.16	13.318	3.055
	Non SLD	31	89.48	8.876	1.594
	Control	50	103.54	7.913	1.119
	Total	100	96.64	11.630	1.163
Block design	SLD	19	86.00	12.552	2.880
	Non SLD	31	86.61	8.253	1.482
	Control	50	101.76	6.090	.861
	Total	100	94.07	11.288	1.129
Object assembly	SLD	19	84.53	9.288	2.131
	Non SLD	31	85.39	7.548	1.356
	Control	50	96.46	4.807	.680
	Total	100	90.76	8.792	.879
Coding	SLD	19	84.84	8.153	1.870
	Non SLD	31	84.06	6.990	1.255
	Control	50	98.56	5.596	.791
	Total	100	91.46	9.663	.966
Maze	SLD	19	84.58	9.512	2.182
	Non SLD	31	85.16	7.686	1.380
	Control	50	96.43	7.624	1.078
	Total	100	90.68	9.823	.982

ANOVA COMPARISON PER IQ		Df	F	Sig.
Picture completion	Between Groups	2	26.803	**.000**
	Within Groups	97		
	Total	99		
Block design	Between Groups	2	42.862	**.000**
	Within Groups	97		
	Total	99		
Object assembly	Between Groups	2	35.954	**.000**
	Within Groups	97		
	Total	99		
Coding	Between Groups	2	58.339	**.000**
	Within Groups	97		
	Total	99		
Maze	Between Groups	2	25.639	**.000**
	Within Groups	97		
	Total	99		

- The three groups differed significantly both within groups and between groups in all the subsets of performance IQ.
- The performance Iq scores in all the subsets were above 84. And overall performance scores were more than verbal scores in all the three groups, more difference being seen in SLD group.
- Object Assembly, Picture completion, Block design which assess the visuo perceptual functioning also impaired in children with SLD.

- Mazes, Analogies and similarities assess the reasoning and problem solving abilities of the child are also impaired in children with SLD.
- Coding which assesses the cognitive or mental speed is also slow in SLD children.

Comparisons of performance IQ between the three groups					
Tukey HSD					
Dependent Variable	(I) Scholastic	(J) Scholastic	Mean Difference (I-J)	Std. Error	Sig.
Picture completion	SLD	NON SLD	.674	2.747	.967
		CONTROL	-13.382*	2.541	**.000**
	NON SLD	SLD	-.674	2.747	.967
		CONTROL	-14.056*	2.156	**.000**
	CONTROL	SLD	13.382*	2.541	**.000**
		NON SLD	14.056*	2.156	**.000**
Block design	SLD	NON SLD	-.613	2.421	.965
		CONTROL	-15.760*	2.239	**.000**
	NON SLD	SLD	.613	2.421	.965
		CONTROL	-15.147*	1.899	**.000**
	CONTROL	SLD	15.760*	2.239	**.000**
		NON SLD	15.147*	1.899	**.000**
Object assembly	SLD	NON SLD	-.861	1.961	.899
		CONTROL	-11.934*	1.814	**.000**
	NON SLD	SLD	.861	1.961	.899
		CONTROL	-11.073*	1.539	**.000**
	CONTROL	SLD	11.934*	1.814	**.000**
		NON SLD	11.073*	1.539	**.000**
Coding	SLD	NON SLD	.778	1.916	.913
		CONTROL	-13.718*	1.773	**.000**
	NON SLD	SLD	-.778	1.916	.913
		CONTROL	-14.495*	1.504	**.000**
	CONTROL	SLD	13.718*	1.773	**.000**
		NON SLD	14.495*	1.504	**.000**
Maze	SLD	NON SLD	-.582	2.339	.966
		CONTROL	-11.849*	2.163	**.000**
	NON SLD	SLD	.582	2.339	.966
		CONTROL	-11.267*	1.835	**.000**
	CONTROL	SLD	11.849*	2.163	**.000**
		NON SLD	11.267*	1.835	**.000**

This table shows that al the performance IQ subtypes significantly differed significantly differed between Control & SLD and Control & Non SLD.

Comparison of cognitive profiles between three groups

DESCRIPTION OF COGNITIVE VARIABLES		N	Mean	Std. Deviation	Std. Error
STBT trial 1	SLD	19	21.74	3.297	.756
	NonSLD	31	20.52	2.826	.508
	control	49	17.55	1.930	.276
	Total	99	19.28	3.069	.308
Trial 2	SLD	19	18.43	3.475	.797
	NonSLD	31	18.08	2.209	.397
	Control	49	16.53	2.108	.301
	Total	99	17.38	2.572	.259
Trial 3	SLD	19	17.19	3.587	.823
	NonSLD	31	16.89	1.712	.308
	Control	50	16.06	1.801	.255
	Total	100	16.53	2.252	.225
N back 1 score	SLD	19	7.53	.513	.118
	NonSLD	31	8.00	.516	.093
	control	40	8.28	.554	.088
	Total	90	8.02	.599	.063
N back 2 score	SLD	19	12.32	1.857	.426
	NonSLD	31	15.90	.908	.163
	control	40	16.18	.931	.147
	Total	90	15.27	1.930	.203

ANOVA COMPARISON OF THREE GROUPS IN COGNITIVE FNS.		df	F	Sig.
STBT trial 1	Between Groups	2	24.138	**.000**
	Within Groups	96		
	Total	98		
Trial 2	Between Groups	2	5.921	**.004**
	Within Groups	96		
	Total	98		
Trial 3	Between Groups	2	2.357	.100
	Within Groups	97		
	Total	99		
N back 1 score	Between Groups	2	12.751	**.000**
	Within Groups	87		
	Total	89		
N back 2 score	Between Groups	2	76.117	**.000**
	Within Groups	87		
	Total	89		

The three groups differed significantly both within groups and between groups in all the domains except SFBT 3.

- Verbal working memory is significantly impaired in children with SLD.
- Motor speed assessed by the SFBT is also slow in children in SLD.

Comparison between groups in Cognitive Functions

The next table reveals that except SFBT trial 3 all the other cognitive functions by SFBT1 SFBT2 n back 1 &2 si significantly differed between Control&SLD and Control&NonSLD.

Comparisons of cognitive functions between three groups					
Tukey HSD					
Dependent Variable	(I) Scholastic	(J) Scholastic	Mean Difference (I-J)	Std. Error	Sig.
STBT trial 1	SLD	NON SLD	1.217	.737	.229
		CONTROL	4.186*	.683	**.000**
	NON SLD	SLD	-1.217	.737	.229
		CONTROL	2.968*	.580	**.000**
	CONTROL	SLD	-4.186*	.683	**.000**
		NON SLD	-2.968*	.580	**.000**
Trial 2	SLD	NON SLD	.346	.714	.879
		CONTROL	1.894*	.663	**.014**
	NON SLD	SLD	-.346	.714	.879
		CONTROL	1.548*	.563	**.019**
	CONTROL	SLD	-1.894*	.663	**.014**
		NON SLD	-1.548*	.563	**.019**
Trial 3	SLD	NON SLD	.302	.647	.887
		CONTROL	1.129	.599	.148
	NON SLD	SLD	-.302	.647	.887
		CONTROL	.827	.508	.239
	CONTROL	SLD	-1.129	.599	.148
		NON SLD	-.827	.508	.239
N back 1 score	SLD	NON SLD	-.474*	.155	**.008**
		CONTROL	-.749*	.148	**.000**
	NON SLD	SLD	.474*	.155	**.008**
		CONTROL	-.275	.128	**.085**
	CONTROL	SLD	.749*	.148	**.000**
		NON SLD	.275	.128	**.085**
N back 2 score	SLD	NON SLD	-3.587*	.343	**.000**
		CONTROL	-3.859*	.328	**.000**
	NON SLD	SLD	3.587*	.343	**.000**
		CONTROL	-.272	.282	.601
	CONTROL	SLD	3.859*	.328	**.000**
		NON SLD	.272	.282	.601

Comparison of children's behavioural and emotional problems

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Affective is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
2	The distribution of Anxiety is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.047	Reject the null hypothesis.
3	The distribution of Somatic is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.604	Retain the null hypothesis.
4	The distribution of ADHD is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
5	The distribution of ODD prob is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.485	Retain the null hypothesis.
6	The distribution of Conduct prob is the same across categories of Category.	Independent-Samples Kruskal-Wallis Test	.612	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The comparison revealed that internalizing symptom of Anxiety , and externalizing symptom of ADHD is more in children with SLD when compared with the other groups .

CORRELATION MATRICS

Control Group Internalising Vs verbal IQ

Correlations

Correlations

		V20	V21	V22	V23	V24	V25	V17	V18	V19
V20	Pearson Correlation	1	.554**	.194	.213	.219	.181	-.115	.124	.290*
	Sig. (2-tailed)		.000	.177	.137	.127	.208	.428	.389	.041
	N	50	50	50	50	50	50	50	50	50
V21	Pearson Correlation	.554**	1	.690**	-.060	.338*	.095	-.101	.174	.460**
	Sig. (2-tailed)	.000		.000	.681	.016	.510	.483	.228	.001
	N	50	50	50	50	50	50	50	50	50
V22	Pearson Correlation	.194	.690**	1	-.071	.218	.091	-.092	.056	.332*
	Sig. (2-tailed)	.177	.000		.625	.129	.528	.524	.702	.018
	N	50	50	50	50	50	50	50	50	50
V23	Pearson Correlation	.213	-.060	-.071	1	.304*	.202	-.125	.148	.153
	Sig. (2-tailed)	.137	.681	.625		.032	.159	.387	.306	.289
	N	50	50	50	50	50	50	50	50	50
V24	Pearson Correlation	.219	.338*	.218	.304*	1	-.021	-.320*	.099	.185
	Sig. (2-tailed)	.127	.016	.129	.032		.886	.023	.496	.198
	N	50	50	50	50	50	50	50	50	50
V25	Pearson Correlation	.181	.095	.091	.202	-.021	1	.175	.035	.129
	Sig. (2-tailed)	.208	.510	.528	.159	.886		.225	.807	.371
	N	50	50	50	50	50	50	50	50	50
V17	Pearson Correlation	-.115	-.101	-.092	-.125	-.320*	.175	1	.025	-.239
	Sig. (2-tailed)	.428	.483	.524	.387	.023	.225		.866	.095
	N	50	50	50	50	50	50	50	50	50
V18	Pearson Correlation	.124	.174	.056	.148	.099	.035	.025	1	.488**
	Sig. (2-tailed)	.389	.228	.702	.306	.496	.807	.866		.000
	N	50	50	50	50	50	50	50	50	50
V19	Pearson Correlation	.290*	.460**	.332*	.153	.185	.129	-.239	.488**	1
	Sig. (2-tailed)	.041	.001	.018	.289	.198	.371	.095	.000	
	N	50	50	50	50	50	50	50	50	50

Internalizing Vs Performance IQ

Correlations

Correlations

		V14	V15	V16	V20	V21	V22	V23	V24	V25
V14	Pearson Correlation	1	.409**	-.155	-.177	-.223	-.064	.001	-.138	-.177
	Sig. (2-tailed)		.003	.284	.220	.120	.657	.996	.339	.219
	N	50	50	50	50	50	50	50	50	50
V15	Pearson Correlation	.409**	1	.022	-.237	-.087	-.112	.181	-.007	-.013
	Sig. (2-tailed)	.003		.879	.098	.547	.437	.209	.959	.927
	N	50	50	50	50	50	50	50	50	50
V16	Pearson Correlation	-.155	.022	1	.079	-.050	-.141	.003	.002	-.001
	Sig. (2-tailed)	.284	.879		.588	.729	.327	.982	.991	.994
	N	50	50	50	50	50	50	50	50	50
V20	Pearson Correlation	-.177	-.237	.079	1	.554**	.194	.213	.219	.181
	Sig. (2-tailed)	.220	.098	.588		.000	.177	.137	.127	.208
	N	50	50	50	50	50	50	50	50	50
V21	Pearson Correlation	-.223	-.087	-.050	.554**	1	.690**	-.060	.338*	.095
	Sig. (2-tailed)	.120	.547	.729	.000		.000	.681	.016	.510
	N	50	50	50	50	50	50	50	50	50
V22	Pearson Correlation	-.064	-.112	-.141	.194	.690**	1	-.071	.218	.091
	Sig. (2-tailed)	.657	.437	.327	.177	.000		.625	.129	.528
	N	50	50	50	50	50	50	50	50	50
V23	Pearson Correlation	.001	.181	.003	.213	-.060	-.071	1	.304*	.202
	Sig. (2-tailed)	.996	.209	.982	.137	.681	.625		.032	.159
	N	50	50	50	50	50	50	50	50	50
V24	Pearson Correlation	-.138	-.007	.002	.219	.338*	.218	.304*	1	-.021
	Sig. (2-tailed)	.339	.959	.991	.127	.016	.129	.032		.886
	N	50	50	50	50	50	50	50	50	50
V25	Pearson Correlation	-.177	-.013	-.001	.181	.095	.091	.202	-.021	1
	Sig. (2-tailed)	.219	.927	.994	.208	.510	.528	.159	.886	
	N	50	50	50	50	50	50	50	50	50

Internalising Vs Cognitive

Correlations

		V17	V18	V19	V27	V28	V29	V30	V31
V17	Pearson Correlation	1	.025	-.239	-.143	.018	-.132	-.012	-.035
	Sig. (2-tailed)		.866	.095	.322	.904	.360	.934	.811
	N	50	50	50	50	50	50	50	50
V18	Pearson Correlation	.025	1	.488**	.173	.019	-.227	.054	-.096
	Sig. (2-tailed)	.866		.000	.231	.895	.113	.708	.507
	N	50	50	50	50	50	50	50	50
V19	Pearson Correlation	-.239	.488**	1	.222	.252	.048	.303*	.138
	Sig. (2-tailed)	.095	.000		.121	.078	.742	.032	.339
	N	50	50	50	50	50	50	50	50
V27	Pearson Correlation	-.143	.173	.222	1	.470**	-.044	.124	-.102
	Sig. (2-tailed)	.322	.231	.121		.001	.763	.389	.481
	N	50	50	50	50	50	50	50	50
V28	Pearson Correlation	.018	.019	.252	.470**	1	.481**	.127	.307*
	Sig. (2-tailed)	.904	.895	.078	.001		.000	.380	.030
	N	50	50	50	50	50	50	50	50
V29	Pearson Correlation	-.132	-.227	.048	-.044	.481**	1	.010	.153
	Sig. (2-tailed)	.360	.113	.742	.763	.000		.945	.290
	N	50	50	50	50	50	50	50	50
V30	Pearson Correlation	-.012	.054	.303*	.124	.127	.010	1	.128
	Sig. (2-tailed)	.934	.708	.032	.389	.380	.945		.377
	N	50	50	50	50	50	50	50	50
V31	Pearson Correlation	-.035	-.096	.138	-.102	.307*	.153	.128	1
	Sig. (2-tailed)	.811	.507	.339	.481	.030	.290	.377	
	N	50	50	50	50	50	50	50	50

Externalising Vs verbal IQ

Correlations

		V27	V28	V29	V30	V31	V14	V15	V16
V27	Pearson Correlation	1	.470**	-.044	.124	-.102	-.217	-.127	.021
	Sig. (2-tailed)		.001	.763	.389	.481	.130	.380	.885
	N	50	50	50	50	50	50	50	50
V28	Pearson Correlation	.470**	1	.481**	.127	.307*	-.070	.166	.017
	Sig. (2-tailed)	.001		.000	.380	.030	.629	.250	.905
	N	50	50	50	50	50	50	50	50
V29	Pearson Correlation	-.044	.481**	1	.010	.153	.097	-.015	-.020
	Sig. (2-tailed)	.763	.000		.945	.290	.505	.920	.889
	N	50	50	50	50	50	50	50	50
V30	Pearson Correlation	.124	.127	.010	1	.128	-.273	-.124	-.174
	Sig. (2-tailed)	.389	.380	.945		.377	.055	.390	.227
	N	50	50	50	50	50	50	50	50
V31	Pearson Correlation	-.102	.307*	.153	.128	1	-.120	.297*	-.167
	Sig. (2-tailed)	.481	.030	.290	.377		.406	.036	.246
	N	50	50	50	50	50	50	50	50
V14	Pearson Correlation	-.217	-.070	.097	-.273	-.120	1	.409**	-.155
	Sig. (2-tailed)	.130	.629	.505	.055	.406		.003	.284
	N	50	50	50	50	50	50	50	50
V15	Pearson Correlation	-.127	.166	-.015	-.124	.297*	.409**	1	.022
	Sig. (2-tailed)	.380	.250	.920	.390	.036	.003		.879
	N	50	50	50	50	50	50	50	50
V16	Pearson Correlation	.021	.017	-.020	-.174	-.167	-.155	.022	1
	Sig. (2-tailed)	.885	.905	.889	.227	.246	.284	.879	
	N	50	50	50	50	50	50	50	50

Externalising Vs Performance IQ

Correlations

Correlatio

		V34	V35	V36	V40	V41	V17	V18	V19
V34	Pearson Correlation	1	.792**	.605**	-.039	-.109	-.020	.051	.204
	Sig. (2-tailed)		.000	.000	.813	.507	.893	.725	.159
	N	49	49	49	39	39	49	49	49
V35	Pearson Correlation	.792**	1	.646**	.090	.056	-.082	-.006	.221
	Sig. (2-tailed)	.000		.000	.585	.735	.576	.969	.128
	N	49	49	49	39	39	49	49	49
V36	Pearson Correlation	.605**	.646**	1	.146	-.173	-.009	.174	.157
	Sig. (2-tailed)	.000	.000		.369	.285	.949	.228	.277
	N	49	49	50	40	40	50	50	50
V40	Pearson Correlation	-.039	.090	.146	1	.501**	-.078	-.048	.104
	Sig. (2-tailed)	.813	.585	.369		.001	.631	.767	.524
	N	39	39	40	40	40	40	40	40
V41	Pearson Correlation	-.109	.056	-.173	.501**	1	-.269	-.186	-.066
	Sig. (2-tailed)	.507	.735	.285	.001		.093	.251	.684
	N	39	39	40	40	40	40	40	40
V17	Pearson Correlation	-.020	-.082	-.009	-.078	-.269	1	.025	-.239
	Sig. (2-tailed)	.893	.576	.949	.631	.093		.866	.095
	N	49	49	50	40	40	50	50	50
V18	Pearson Correlation	.051	-.006	.174	-.048	-.186	.025	1	.488**
	Sig. (2-tailed)	.725	.969	.228	.767	.251	.866		.000
	N	49	49	50	40	40	50	50	50
V19	Pearson Correlation	.204	.221	.157	.104	-.066	-.239	.488**	1
	Sig. (2-tailed)	.159	.128	.277	.524	.684	.095	.000	
	N	49	49	50	40	40	50	50	50

Externalizing Vs Cognitive

Correlations

Correlatic

		V14	V15	V16	V34	V35	V36	V40	V41
V14	Pearson Correlation	1	.409**	-.155	-.187	-.169	-.242	.029	.013
	Sig. (2-tailed)		.003	.284	.199	.247	.091	.858	.936
	N	50	50	50	49	49	50	40	40
V15	Pearson Correlation	.409**	1	.022	.114	.179	-.015	.127	.211
	Sig. (2-tailed)	.003		.879	.436	.218	.919	.435	.190
	N	50	50	50	49	49	50	40	40
V16	Pearson Correlation	-.155	.022	1	-.002	.002	-.140	-.232	.078
	Sig. (2-tailed)	.284	.879		.991	.991	.332	.151	.634
	N	50	50	50	49	49	50	40	40
V34	Pearson Correlation	-.187	.114	-.002	1	.792**	.605**	-.039	-.109
	Sig. (2-tailed)	.199	.436	.991		.000	.000	.813	.507
	N	49	49	49	49	49	49	39	39
V35	Pearson Correlation	-.169	.179	.002	.792**	1	.646**	.090	.056
	Sig. (2-tailed)	.247	.218	.991	.000		.000	.585	.735
	N	49	49	49	49	49	49	39	39
V36	Pearson Correlation	-.242	-.015	-.140	.605**	.646**	1	.146	-.173
	Sig. (2-tailed)	.091	.919	.332	.000	.000		.369	.285
	N	50	50	50	49	49	50	40	40
V40	Pearson Correlation	.029	.127	-.232	-.039	.090	.146	1	.501**
	Sig. (2-tailed)	.858	.435	.151	.813	.585	.369		.001
	N	40	40	40	39	39	40	40	40
V41	Pearson Correlation	.013	.211	.078	-.109	.056	-.173	.501**	1
	Sig. (2-tailed)	.936	.190	.634	.507	.735	.285	.001	
	N	40	40	40	39	39	40	40	40

Study without SLD: Externalising Vs Cognitive Function

Correlations **Correlations**

		ADHD	ODD prob	Conduct prob	STBT trial 1	Trial 2	Trial 3	N back 1 score	N back 2 score
ADHD	Pearson Correlation	1	.607**	.204	-.030	-.339	.094	.000	.156
	Sig. (2-tailed)		.000	.271	.872	.062	.613	1.000	.402
	N	31	31	31	31	31	31	31	31
ODD prob	Pearson Correlation	.607**	1	.437*	-.039	-.321	-.038	-.320	.292
	Sig. (2-tailed)	.000		.014	.835	.078	.840	.079	.111
	N	31	31	31	31	31	31	31	31
Conduct prob	Pearson Correlation	.204	.437*	1	.111	-.212	-.136	-.161	.126
	Sig. (2-tailed)	.271	.014		.551	.252	.464	.388	.498
	N	31	31	31	31	31	31	31	31
STBT trial 1	Pearson Correlation	-.030	-.039	.111	1	.372*	.353	.011	-.215
	Sig. (2-tailed)	.872	.835	.551		.039	.051	.951	.245
	N	31	31	31	31	31	31	31	31
Trial 2	Pearson Correlation	-.339	-.321	-.212	.372*	1	.536**	.178	.047
	Sig. (2-tailed)	.062	.078	.252	.039		.002	.337	.801
	N	31	31	31	31	31	31	31	31
Trial 3	Pearson Correlation	.094	-.038	-.136	.353	.536**	1	.132	-.179
	Sig. (2-tailed)	.613	.840	.464	.051	.002		.479	.336
	N	31	31	31	31	31	31	31	31
N back 1 score	Pearson Correlation	.000	-.320	-.161	.011	.178	.132	1	.142
	Sig. (2-tailed)	1.000	.079	.388	.951	.337	.479		.445
	N	31	31	31	31	31	31	31	31
N back 2 score	Pearson Correlation	.156	.292	.126	-.215	.047	-.179	.142	1
	Sig. (2-tailed)	.402	.111	.498	.245	.801	.336	.445	
	N	31	31	31	31	31	31	31	31

Externalising Vs Performance IQ

Correlations **Correlations**

		ADHD	ODD prob	Conduct prob	Picture completion	Block design	Object assembly	Coding	Maze
ADHD	Pearson Correlation	1	.607**	.204	-.166	-.180	-.163	-.114	.013
	Sig. (2-tailed)		.000	.271	.371	.333	.382	.541	.943
	N	31	31	31	31	31	31	31	31
ODD prob	Pearson Correlation	.607**	1	.437*	.156	.115	.146	.202	.175
	Sig. (2-tailed)	.000		.014	.402	.539	.434	.277	.347
	N	31	31	31	31	31	31	31	31
Conduct prob	Pearson Correlation	.204	.437*	1	.104	.073	.321	.333	.004
	Sig. (2-tailed)	.271	.014		.579	.697	.079	.067	.981
	N	31	31	31	31	31	31	31	31
Picture completion	Pearson Correlation	-.166	.156	.104	1	.436*	.359*	.439*	.402*
	Sig. (2-tailed)	.371	.402	.579		.014	.047	.014	.025
	N	31	31	31	31	31	31	31	31
Block design	Pearson Correlation	-.180	.115	.073	.436*	1	.518**	.370*	.422*
	Sig. (2-tailed)	.333	.539	.697	.014		.003	.041	.018
	N	31	31	31	31	31	31	31	31
Object assembly	Pearson Correlation	-.163	.146	.321	.359*	.518**	1	.247	.261
	Sig. (2-tailed)	.382	.434	.079	.047	.003		.180	.155
	N	31	31	31	31	31	31	31	31
Coding	Pearson Correlation	-.114	.202	.333	.439*	.370*	.247	1	.303
	Sig. (2-tailed)	.541	.277	.067	.014	.041	.180		.097
	N	31	31	31	31	31	31	31	31
Maze	Pearson Correlation	.013	.175	.004	.402*	.422*	.261	.303	1
	Sig. (2-tailed)	.943	.347	.981	.025	.018	.155	.097	
	N	31	31	31	31	31	31	31	31

Externalising Vs Verbal

Correlations

		ADHD	ODD prob	Conduct prob	General infor	Comprehension	Arithmetic	Analogies similarities	Vocabulary	Digit span
ADHD	Pearson Correlation	1	.607**	.204	.053	.391*	-.076	-.107	.015	.331
	Sig. (2-tailed)		.000	.271	.777	.030	.684	.568	.938	.069
	N	31	31	31	31	31	31	31	31	31
ODD prob	Pearson Correlation	.607**	1	.437*	.285	.358*	.159	.233	.262	.355*
	Sig. (2-tailed)	.000		.014	.121	.048	.394	.206	.155	.050
	N	31	31	31	31	31	31	31	31	31
Conduct prob	Pearson Correlation	.204	.437*	1	.208	.396*	.184	.072	-.038	.114
	Sig. (2-tailed)	.271	.014		.261	.027	.323	.699	.838	.540
	N	31	31	31	31	31	31	31	31	31
General infor	Pearson Correlation	.053	.285	.208	1	.511**	.112	.140	-.129	.195
	Sig. (2-tailed)	.777	.121	.261		.003	.547	.454	.489	.293
	N	31	31	31	31	31	31	31	31	31
Comprehension	Pearson Correlation	.391*	.358*	.396*	.511**	1	.292	.164	-.076	.153
	Sig. (2-tailed)	.030	.048	.027	.003		.111	.378	.686	.411
	N	31	31	31	31	31	31	31	31	31
Arithmetic	Pearson Correlation	-.076	.159	.184	.112	.292	1	.481**	.096	.241
	Sig. (2-tailed)	.684	.394	.323	.547	.111		.006	.608	.191
	N	31	31	31	31	31	31	31	31	31
Analogies similarities	Pearson Correlation	-.107	.233	.072	.140	.164	.481**	1	.142	.339
	Sig. (2-tailed)	.568	.206	.699	.454	.378	.006		.447	.062
	N	31	31	31	31	31	31	31	31	31
Vocabulary	Pearson Correlation	.015	.262	-.038	-.129	-.076	.096	.142	1	.475**
	Sig. (2-tailed)	.938	.155	.838	.489	.686	.608	.447		.007
	N	31	31	31	31	31	31	31	31	31
Digit span	Pearson Correlation	.331	.355*	.114	.195	.153	.241	.339	.475**	1
	Sig. (2-tailed)	.069	.050	.540	.293	.411	.191	.062	.007	
	N	31	31	31	31	31	31	31	31	31

Internalising Vs Cognitive Function

Correlations

		Affective	Anxiety	Somatic	STBT trial 1	Trial 2	Trial 3	N back 1 score	N back 2 score
Affective	Pearson Correlation	1	.552**	.203	-.020	.086	.212	-.091	-.133
	Sig. (2-tailed)		.001	.274	.917	.644	.253	.628	.474
	N	31	31	31	31	31	31	31	31
Anxiety	Pearson Correlation	.552**	1	.024	-.138	-.040	-.109	-.157	-.296
	Sig. (2-tailed)	.001		.897	.460	.833	.561	.399	.106
	N	31	31	31	31	31	31	31	31
Somatic	Pearson Correlation	.203	.024	1	-.093	-.085	-.269	.039	.198
	Sig. (2-tailed)	.274	.897		.619	.650	.144	.837	.287
	N	31	31	31	31	31	31	31	31
STBT trial 1	Pearson Correlation	-.020	-.138	-.093	1	.372*	.353	.011	-.215
	Sig. (2-tailed)	.917	.460	.619		.039	.051	.951	.245
	N	31	31	31	31	31	31	31	31
Trial 2	Pearson Correlation	.086	-.040	-.085	.372*	1	.536**	.178	.047
	Sig. (2-tailed)	.644	.833	.650	.039		.002	.337	.801
	N	31	31	31	31	31	31	31	31
Trial 3	Pearson Correlation	.212	-.109	-.269	.353	.536**	1	.132	-.179
	Sig. (2-tailed)	.253	.561	.144	.051	.002		.479	.336
	N	31	31	31	31	31	31	31	31
N back 1 score	Pearson Correlation	-.091	-.157	.039	.011	.178	.132	1	.142
	Sig. (2-tailed)	.628	.399	.837	.951	.337	.479		.445
	N	31	31	31	31	31	31	31	31
N back 2 score	Pearson Correlation	-.133	-.296	.198	-.215	.047	-.179	.142	1
	Sig. (2-tailed)	.474	.106	.287	.245	.801	.336	.445	
	N	31	31	31	31	31	31	31	31

Internalising Vs Performance IQ

Correlations **Correlations**

		Affective	Anxiety	Somatic	Picture completion	Block design	Object assembly	Coding	Maze
Affective	Pearson Correlation	1	.552**	.203	.242	.033	-.140	-.049	.165
	Sig. (2-tailed)		.001	.274	.189	.858	.451	.795	.376
	N	31	31	31	31	31	31	31	31
Anxiety	Pearson Correlation	.552**	1	.024	.428*	.097	.117	.220	.326
	Sig. (2-tailed)	.001		.897	.016	.603	.530	.234	.073
	N	31	31	31	31	31	31	31	31
Somatic	Pearson Correlation	.203	.024	1	-.025	-.094	-.174	-.017	.122
	Sig. (2-tailed)	.274	.897		.895	.614	.349	.927	.514
	N	31	31	31	31	31	31	31	31
Picture completion	Pearson Correlation	.242	.428*	-.025	1	.436*	.359*	.439*	.402*
	Sig. (2-tailed)	.189	.016	.895		.014	.047	.014	.025
	N	31	31	31	31	31	31	31	31
Block design	Pearson Correlation	.033	.097	-.094	.436*	1	.518**	.370*	.422*
	Sig. (2-tailed)	.858	.603	.614	.014		.003	.041	.018
	N	31	31	31	31	31	31	31	31
Object assembly	Pearson Correlation	-.140	.117	-.174	.359*	.518**	1	.247	.261
	Sig. (2-tailed)	.451	.530	.349	.047	.003		.180	.155
	N	31	31	31	31	31	31	31	31
Coding	Pearson Correlation	-.049	.220	-.017	.439*	.370*	.247	1	.303
	Sig. (2-tailed)	.795	.234	.927	.014	.041	.180		.097
	N	31	31	31	31	31	31	31	31
Maze	Pearson Correlation	.165	.326	.122	.402*	.422*	.261	.303	1
	Sig. (2-tailed)	.376	.073	.514	.025	.018	.155	.097	
	N	31	31	31	31	31	31	31	31

Internalising Vs Verbal IQ

Correlations **Correlations** **Correlations**

		Affective	Anxiety	Somatic	General infor	Comprehension	Arithmetic	Analogies similarities	Vocabulary	Digit span
Affective	Pearson Correlation	1	.552**	.203	.171	-.147	.065	.205	.138	.056
	Sig. (2-tailed)		.001	.274	.356	.430	.729	.269	.460	.766
	N	31	31	31	31	31	31	31	31	31
Anxiety	Pearson Correlation	.552**	1	.024	.067	-.281	.065	.252	.212	-.027
	Sig. (2-tailed)	.001		.897	.721	.125	.728	.171	.253	.886
	N	31	31	31	31	31	31	31	31	31
Somatic	Pearson Correlation	.203	.024	1	.092	-.203	.047	-.018	.053	.258
	Sig. (2-tailed)	.274	.897		.622	.272	.804	.924	.778	.160
	N	31	31	31	31	31	31	31	31	31
General infor	Pearson Correlation	.171	.067	.092	1	.511**	.112	.140	-.129	.195
	Sig. (2-tailed)	.356	.721	.622		.003	.547	.454	.489	.293
	N	31	31	31	31	31	31	31	31	31
Comprehension	Pearson Correlation	-.147	-.281	-.203	.511**	1	.292	.164	-.076	.153
	Sig. (2-tailed)	.430	.125	.272	.003		.111	.378	.686	.411
	N	31	31	31	31	31	31	31	31	31
Arithmetic	Pearson Correlation	.065	.065	.047	.112	.292	1	.481**	.096	.241
	Sig. (2-tailed)	.729	.728	.804	.547	.111		.006	.608	.191
	N	31	31	31	31	31	31	31	31	31
Analogies similarities	Pearson Correlation	.205	.252	-.018	.140	.164	.481**	1	.142	.339
	Sig. (2-tailed)	.269	.171	.924	.454	.378	.006		.447	.062
	N	31	31	31	31	31	31	31	31	31
Vocabulary	Pearson Correlation	.138	.212	.053	-.129	-.076	.096	.142	1	.475**
	Sig. (2-tailed)	.460	.253	.778	.489	.686	.608	.447		.007
	N	31	31	31	31	31	31	31	31	31
Digit span	Pearson Correlation	.056	-.027	.258	.195	.153	.241	.339	.475**	1
	Sig. (2-tailed)	.766	.886	.160	.293	.411	.191	.062	007	
	N	31	31	31	31	31	31	31	31	31

Study with SLD: Externalizing Vs Cognitive

Correlations

Correlations

		ADHD	ODD prob	Conduct prob	STBT trial 1	Trial 2	Trial 3	N back 1 score	N back 2 score
ADHD	Pearson Correlation	1	.284	.371	-.052	-.233	-.393	-.106	-.285
	Sig. (2-tailed)		.238	.118	.831	.336	.096	.665	.237
	N	19	19	19	19	19	19	19	19
ODD prob	Pearson Correlation	.284	1	.724**	.174	.024	-.077	.019	-.053
	Sig. (2-tailed)	.238		.000	.477	.923	.755	.937	.829
	N	19	19	19	19	19	19	19	19
Conduct prob	Pearson Correlation	.371	.724**	1	.120	.023	-.226	-.023	-.157
	Sig. (2-tailed)	.118	.000		.624	.925	.353	.925	.520
	N	19	19	19	19	19	19	19	19
STBT trial 1	Pearson Correlation	-.052	.174	.120	1	.746**	.568*	-.101	-.417
	Sig. (2-tailed)	.831	.477	.624		.000	.011	.681	.076
	N	19	19	19	19	19	19	19	19
Trial 2	Pearson Correlation	-.233	.024	.023	.746**	1	.577**	-.189	-.409
	Sig. (2-tailed)	.336	.923	.925	.000		.010	.439	.082
	N	19	19	19	19	19	19	19	19
Trial 3	Pearson Correlation	-.393	-.077	-.226	.568*	.577**	1	-.115	-.235
	Sig. (2-tailed)	.096	.755	.353	.011	.010		.641	.332
	N	19	19	19	19	19	19	19	19
N back 1 score	Pearson Correlation	-.106	.019	-.023	-.101	-.189	-.115	1	.457*
	Sig. (2-tailed)	.665	.937	.925	.681	.439	.641		.049
	N	19	19	19	19	19	19	19	19
N back 2 score	Pearson Correlation	-.285	-.053	-.157	-.417	-.409	-.235	.457*	1
	Sig. (2-tailed)	.237	.829	.520	.076	.082	.332	.049	
	N	19	19	19	19	19	19	19	19

Externalising Vs Performance IQ

Correlations

Correlations

		ADHD	ODD prob	Conduct prob	Picture completion	Block design	Object assembly	Coding	Maze
ADHD	Pearson Correlation	1	.284	.371	.024	.138	-.152	.137	-.025
	Sig. (2-tailed)		.238	.118	.923	.573	.534	.577	.920
	N	19	19	19	19	19	19	19	19
ODD prob	Pearson Correlation	.284	1	.724**	.385	.090	.075	.392	.222
	Sig. (2-tailed)	.238		.000	.104	.713	.761	.097	.361
	N	19	19	19	19	19	19	19	19
Conduct prob	Pearson Correlation	.371	.724**	1	.531*	.287	.265	.487*	.388
	Sig. (2-tailed)	.118	.000		.019	.234	.273	.034	.101
	N	19	19	19	19	19	19	19	19
Picture completion	Pearson Correlation	.024	.385	.531*	1	.727**	.672**	.615**	.836**
	Sig. (2-tailed)	.923	.104	.019		.000	.002	.005	.000
	N	19	19	19	19	19	19	19	19
Block design	Pearson Correlation	.138	.090	.287	.727**	1	.635**	.711**	.742**
	Sig. (2-tailed)	.573	.713	.234	.000		.003	.001	.000
	N	19	19	19	19	19	19	19	19
Object assembly	Pearson Correlation	-.152	.075	.265	.672**	.635**	1	.634**	.791**
	Sig. (2-tailed)	.534	.761	.273	.002	.003		.004	.000
	N	19	19	19	19	19	19	19	19
Coding	Pearson Correlation	.137	.392	.487*	.615**	.711**	.634**	1	.574*
	Sig. (2-tailed)	.577	.097	.034	.005	.001	.004		.010
	N	19	19	19	19	19	19	19	19
Maze	Pearson Correlation	-.025	.222	.388	.836**	.742**	.791**	.574*	1
	Sig. (2-tailed)	.920	.361	.101	.000	.000	.000	.010	
	N	19	19	19	19	19	19	19	19

Externalising Vs Verbal IQ

Correlations / **Correlations** / **Correlations**

		ADHD	ODD prob	Conduct prob	General infor	Comprehension	Arithmetic	Analogies similarities	Vocabulary	Digit span
ADHD	Pearson Correlation	1	.284	.371	-.235	.137	-.089	-.092	-.437	.027
	Sig. (2-tailed)		.238	.118	.333	.575	.718	.709	.061	.913
	N	19	19	19	19	19	19	19	19	19
ODD prob	Pearson Correlation	.284	1	.724**	.107	.356	.073	.398	-.242	.261
	Sig. (2-tailed)	.238		.000	.664	.135	.766	.092	.318	.281
	N	19	19	19	19	19	19	19	19	19
Conduct prob	Pearson Correlation	.371	.724**	1	.187	.410	-.019	.291	-.205	.457*
	Sig. (2-tailed)	.118	.000		.444	.081	.937	.226	.399	.049
	N	19	19	19	19	19	19	19	19	19
General infor	Pearson Correlation	-.235	.107	.187	1	.431	.315	.761**	.550*	.093
	Sig. (2-tailed)	.333	.664	.444		.065	.189	.000	.015	.705
	N	19	19	19	19	19	19	19	19	19
Comprehension	Pearson Correlation	.137	.356	.410	.431	1	.062	.687**	.183	.250
	Sig. (2-tailed)	.575	.135	.081	.065		.801	.001	.454	.302
	N	19	19	19	19	19	19	19	19	19
Arithmetic	Pearson Correlation	-.089	.073	-.019	.315	.062	1	.371	.412	.543*
	Sig. (2-tailed)	.718	.766	.937	.189	.801		.118	.080	.016
	N	19	19	19	19	19	19	19	19	19
Analogies similarities	Pearson Correlation	-.092	.398	.291	.761**	.687**	.371	1	.283	.166
	Sig. (2-tailed)	.709	.092	.226	.000	.001	.118		.241	.497
	N	19	19	19	19	19	19	19	19	19
Vocabulary	Pearson Correlation	-.437	-.242	-.205	.550*	.183	.412	.283	1	.331
	Sig. (2-tailed)	.061	.318	.399	.015	.454	.080	.241		.167
	N	19	19	19	19	19	19	19	19	19
Digit span	Pearson Correlation	.027	.261	.457*	.093	.250	.543*	.166	.331	1
	Sig. (2-tailed)	.913	.281	.049	.705	.302	.016	.497	.167	
	N	19	19	19	19	19	19	19	19	19

Internalising Vs Cognitive Fns

Correlations / **Correlations**

		Affective	Anxiety	Somatic	STBT trial 1	Trial 2	Trial 3	N back 1 score	N back 2 score
Affective	Pearson Correlation	1	.667**	.210	.249	.296	.402	.139	-.017
	Sig. (2-tailed)		.002	.387	.304	.218	.088	.571	.945
	N	19	19	19	19	19	19	19	19
Anxiety	Pearson Correlation	.667**	1	-.104	.261	.083	.397	-.135	-.094
	Sig. (2-tailed)	.002		.672	.280	.737	.092	.580	.703
	N	19	19	19	19	19	19	19	19
Somatic	Pearson Correlation	.210	-.104	1	.036	.027	.133	.389	.455
	Sig. (2-tailed)	.387	.672		.884	.912	.586	.100	.051
	N	19	19	19	19	19	19	19	19
STBT trial 1	Pearson Correlation	.249	.261	.036	1	.746**	.568*	-.101	-.417
	Sig. (2-tailed)	.304	.280	.884		.000	.011	.681	.076
	N	19	19	19	19	19	19	19	19
Trial 2	Pearson Correlation	.296	.083	.027	.746**	1	.577**	-.189	-.409
	Sig. (2-tailed)	.218	.737	.912	.000		.010	.439	.082
	N	19	19	19	19	19	19	19	19
Trial 3	Pearson Correlation	.402	.397	.133	.568*	.577**	1	-.115	-.235
	Sig. (2-tailed)	.088	.092	.586	.011	.010		.641	.332
	N	19	19	19	19	19	19	19	19
N back 1 score	Pearson Correlation	.139	-.135	.389	-.101	-.189	-.115	1	.457*
	Sig. (2-tailed)	.571	.580	.100	.681	.439	.641		.049
	N	19	19	19	19	19	19	19	19
N back 2 score	Pearson Correlation	-.017	-.094	.455	-.417	-.409	-.235	.457*	1
	Sig. (2-tailed)	.945	.703	.051	.076	.082	.332	.049	
	N	19	19	19	19	19	19	19	19

Internalising Vs Performance IQ

Correlations **Correlations** **Correlations**

		Affective	Anxiety	Somatic	Picture completion	Block design	Object assembly	Coding	Maze	Performance iq
Affective	Pearson Correlation	1	.667**	.210	-.469*	-.144	-.270	-.054	-.598**	-.404
	Sig. (2-tailed)		.002	.387	.043	.558	.264	.825	.007	.086
	N	19	19	19	19	19	19	19	19	19
Anxiety	Pearson Correlation	.667**	1	-.104	-.364	-.175	-.297	-.004	-.397	-.350
	Sig. (2-tailed)	.002		.672	.125	.475	.216	.987	.093	.142
	N	19	19	19	19	19	19	19	19	19
Somatic	Pearson Correlation	.210	-.104	1	-.070	.024	.298	.264	-.080	.088
	Sig. (2-tailed)	.387	.672		.776	.922	.215	.275	.746	.722
	N	19	19	19	19	19	19	19	19	19
Picture completion	Pearson Correlation	-.469*	-.364	-.070	1	.727**	.672**	.615**	.836**	.883**
	Sig. (2-tailed)	.043	.125	.776		.000	.002	.005	.000	.000
	N	19	19	19	19	19	19	19	19	19
Block design	Pearson Correlation	-.144	-.175	.024	.727**	1	.635**	.711**	.742**	.829**
	Sig. (2-tailed)	.558	.475	.922	.000		.003	.001	.000	.000
	N	19	19	19	19	19	19	19	19	19
Object assembly	Pearson Correlation	-.270	-.297	.298	.672**	.635**	1	.634**	.791**	.853**
	Sig. (2-tailed)	.264	.216	.215	.002	.003		.004	.000	.000
	N	19	19	19	19	19	19	19	19	19
Coding	Pearson Correlation	-.054	-.004	.264	.615**	.711**	.634**	1	.574*	.769**
	Sig. (2-tailed)	.825	.987	.275	.005	.001	.004		.010	.000
	N	19	19	19	19	19	19	19	19	19
Maze	Pearson Correlation	-.598**	-.397	-.080	.836**	.742**	.791**	.574*	1	.929**
	Sig. (2-tailed)	.007	.093	.746	.000	.000	.000	.010		.000
	N	19	19	19	19	19	19	19	19	19
Performance iq	Pearson Correlation	-.404	-.350	.088	.883**	.829**	.853**	.769**	.929**	1
	Sig. (2-tailed)	.086	.142	.722	.000	.000	.000	.000	.000	
	N	19	19	19	19	19	19	19	19	19

Externalising Vs Verbal IQ

Correlations **Correlations** **Correlations**

		Affective	Anxiety	Somatic	General infor	Comprehension	Arithmetic	Analogies similarities	Vocabulary	Digit span
Affective	Pearson Correlation	1	.667**	.210	-.051	.016	-.423	-.092	-.244	-.398
	Sig. (2-tailed)		.002	.387	.837	.949	.071	.709	.315	.092
	N	19	19	19	19	19	19	19	19	19
Anxiety	Pearson Correlation	.667**	1	-.104	.114	.065	-.307	.021	-.242	-.237
	Sig. (2-tailed)	.002		.672	.643	.791	.201	.932	.318	.329
	N	19	19	19	19	19	19	19	19	19
Somatic	Pearson Correlation	.210	-.104	1	-.155	.264	-.325	-.108	.168	-.114
	Sig. (2-tailed)	.387	.672		.527	.275	.174	.661	.491	.643
	N	19	19	19	19	19	19	19	19	19
General infor	Pearson Correlation	-.051	.114	-.155	1	.431	.315	.761**	.550*	.093
	Sig. (2-tailed)	.837	.643	.527		.065	.189	.000	.015	.705
	N	19	19	19	19	19	19	19	19	19
Comprehension	Pearson Correlation	.016	.065	.264	.431	1	.062	.687**	.183	.250
	Sig. (2-tailed)	.949	.791	.275	.065		.801	.001	.454	.302
	N	19	19	19	19	19	19	19	19	19
Arithmetic	Pearson Correlation	-.423	-.307	-.325	.315	.062	1	.371	.412	.543*
	Sig. (2-tailed)	.071	.201	.174	.189	.801		.118	.080	.016
	N	19	19	19	19	19	19	19	19	19
Analogies similarities	Pearson Correlation	-.092	.021	-.108	.761**	.687**	.371	1	.283	.166
	Sig. (2-tailed)	.709	.932	.661	.000	.001	.118		.241	.497
	N	19	19	19	19	19	19	19	19	19
Vocabulary	Pearson Correlation	-.244	-.242	.168	.550*	.183	.412	.283	1	.331
	Sig. (2-tailed)	.315	.318	.491	.015	.454	.080	.241		.167
	N	19	19	19	19	19	19	19	19	19
Digit span	Pearson Correlation	-.398	-.237	-.114	.093	.250	.543*	.166	.331	1
	Sig. (2-tailed)	.092	.329	.643	.705	.302	.016	.497	.167	
	N	19	19	19	19	19	19	19	19	19

Inter Correlation Matrix of all the Data Shows that Performance Maze is Negatively correlated with Anxiety.

RESULTS

1. About 19 children in the study group has specific Learning Disorders, in that 13 children have reading disorder and disorders of written expression and 15 children have arithmetic disorder and 6 children have arithmetic disorder alone and 9 children have mixed type with all three disorders together.

2. After dividing into three groups namely

    a. Normal

    b. Study without SLD

    c. Study with SLD

    which were then compared, revealed the, SLD children differ significantly in father's occupational status from the other two.

3. Habit of watching TV more than 3 hours is seen in children with SLD.

4. When comparing Behavioral and emotional problems, study group had more internalizing (Anxiety) and externalizing problems (ADHD, ODD)

5. Children with SLD have more ADHD features and somatic complaints.

6. Verbal & performance IQ scores are low in SLD children,

7. SLD children have impaired verbal working memory.

8. Intercorrelation in all the three groups in all the components of IQ and Cognitive functions showed that Maze subtype of Performance IQ is negatively intercorrelated with Internalising symptom of Anxiety. Low performance in Maze is correlated with high Anxiety.

Discussion

Poor scholastic performance is one of the commonest reasons for a child to be referred to child guidance clinic. In the present society academic activities are stressed to such an extent that parents started to seek admission for their children to kindergarten just after confirmation of pregnancy. This is the scenario in most of the metropolitan cities like Chennai.

In such competitive metro city Chennai, what was the scholastic performance of the children studying in corporation schools who are studying with regional language Tamil as their medium of instruction, needs to be thrown more ligh After getting permission from Deputy Commissioner (DC) Education and Educational Officer (EO),the

corporation schools attached to ICH Egmore, school health programme was selected for the study,

The educational system had been revolutionalised after the introduction of SSA (Sharva Shisksha Abiyan) scheme. The children are provided various opportunities to learn. Each and every child has their own set of cards, charts, story books, exercise books, play materials, so that they can learn on their own, under the guidance of teacher. Group activities are also conducted in fixed time intervals to encourage children and create healthy competition in learning process. There was no traditional way of teaching the lessons from text book and conducting tests and examinations.

There was a ladder chart for each child and the teacher has to periodically assess the child's individual step by step progress. Even if the child is absent for one or two days he or she will not going to miss the lessons and they can very well continue the card or book where they were before.

The classroom conditions was also very much conducive to learning with spacious classrooms, clean, well illuminated and well maintained. Each children are provided separate blackboard which was painted on the wall for their written works, which can be easily seen by the teacher at a glance.

A special mention about the teacher student ratio needs to be given here, since this plays a crucial role in the academic achievement of the child. In my study classes IV & V the average number of children per class is 22 and the classes are not overcrowded. So, 1:22 teacher student ratio makes teaching and learning more comfortable. The children come in proper uniforms, ID cards and school bags issued by the govt. The overall appearance of classrooms was full of charts hanging in ropes and artworks done by the children displayed all around. This depicts that the students' hidden talents are also explored in school.

One aspect which makes the school management and teachers to worry about is the dropouts and low census. During the afternoon hours when Iwent for assessment of the child, I saw teachers going to field visit weekly once to bring back the dropout children.

I had a chance to see the special educator, who visits the school twice a month. She was appointed under SSA scheme, specially trained to train and educate mentally retarded, learning disabled and autistic children. She has the list of children with these deficits and conducts special classes and training sessions and periodically assesses their progress. She is very well aware of the learning problems and SLD and I coordinated with her and gave the list of children whom I found to have learning disorder.

In this study, children in the age group of 9-10 years, studying IV &V standard were selected because, children's learning problems become more evident and noticed by teachers and parents in IV & V standard only. This is because reading and writing becomes a part and parcel of the curriculum and deficits in this area will be more evident during this time, and appropriate intervention strategies if started early will give a good outcome.

Among the 362 children, studying in IV & V std, after exclusion of 30 children, in the remaining 332 children, about 38.85% (129) of the children were scholastically backward and 61.14% (203) children were scholastically average this is consistent with the previous studies by Sarkar [10] showing 29.90% and Rozario 32.02 % [11], Venogopal 20.06% [12]

50 scholastically backward children were taken as study group and 50 scholastically average children were taken as control to compare all the variables to be studied, after proper sampling techniques. Informed consent obtained from the parents by giving the consent form to child to home and then collecting that back from the child. All the parents gave consent and some parents came to school in person to get information.

The socio demographic details were collected from children and then the CBCL-TRF filled by reports from the teachers who observed the

child for at least two months. Then the battery of tests were given to assess the IQ, learning disorders and cognitive functions.

Because of the lengthy time taken to complete the tests like MISIC, NIMHANS LD battery, some students felt bored and needed incentives like chocolates and pencils, which encouraged them to participate in the study with some more involvement.

Overall the children did the performance tests of IQ and SFBT with more enthusiasm, than the verbal tests and LD battery's writing and reading tasks. The children performed well when their class teacher was by their side and encouraged them.

Socio demographic Profiles

The sample consisted of 41 children studying in IV standard and 59 children in V std with 63 boys and 37 girls altogether.

The demographic variables were also compared between the three groups namely, Control, Study without SLD, Study with SLD. This showed significance in two variables.

Previous studies by Shenoy et al [1] have proved that, socio demographic and economic factors like education, occupation, single parents influenced the learning disorders significantly.

But this study found that the father's occupation was significantly associated with SLD, with **p value of 0.026** (<0.05). so it was inferred that father's occupational status which in turn reflect on the family dynamics by determining the harmonious father mother interaction and less financial conflicts and overall wellbeing in the family environment. In a study by Govind Bapna [44], similar findings was reported that 10/21 children's father's occupation significantly associated with learning disorders.

The second significant variable is the TV viewing habits of children, with **P value of 0.022**. SLD children are more interested in viewing Television. This was consistent with the previous studies by Shenoy et al [1] in India. American study done by Robert Hancox et al also proved that excessive TV viewing not only affects the child's learning but also results in long lasting adverse consequences in future academic achievement and excellence.

Higher number of learning disorders in male children by previous literatures, made to mention the dyslexics as "He". Madhan Gopal Chaudhary [9] also reported 10.25% of more learning disorders in male gender. But this study does not find any significant difference in gender.

It is worth noting that children with SLD were not significantly absent frequently as compared to other groups, which makes us realize

that these children with normal IQ understands the importance of education, but unable to perform academically adequate because of developmental and genetic nature of SLD.

Various previous studies [20] [1] found lower educational status of fathers in SLD children which was not present in this study. The other socio demographic variables like parents educational status, teaching member in the home, were not associated significantly as with [1].

Specific Learning Disorders (SLD)

Community surveys on learning disorders are very little and marked by methodological lacunae including small sample size, lack of specific screening tool, lack of tools in regional languages and unspecified clinical criteria for case ascertainment.

At present there is a increase in awareness among masses after a movie being released in this issue, depicting learning disability.[9]

Hospital based studies report 1% has learning disorders, but in the community the rate varies between 5-15% this variation is due to difference in tool selection, study area and sample selection.

In this study SLD is present in 19 children, with 13 children having Reading disorder and disorders of written expression, 15 children having

arithmetic disorder and 6 children having arithmetic disorder alone, 9 children have Mixed disorders of scholastic skills.

High co morbidity of reading and disorders of written expression was reported by various previous studies. It was interesting to observe the lesser occurrence of reading and disorder of written expression than what was expected because of the fact that Tamil language is having transparent orthography and more phonetic when compared to English.

The list of children identified as having SLD were notified to the special educator of SSA scheme. She then coordinated with parents regarding remedial education and advised about the follow up and detailed evaluation in Child guidance clinic, Institute of Child Health.

Psychological aspects of scholastic problems

An important finding in this study is the association between psychological problems which were noted more in scholastically backward children, when compared with controls.

In the Child Behaviour checklist, both internalizing and externalizing behavioural problems were more in study children.

In the cluster of internalizing syndromes Anxiety ia significantly associated with p value of 0.017. In the externalizing cluster, ADHD and ODD were statistically significant with P value of 0.001 and 0.015

respectively. This was consistent with previous studiesby Goving Bapna et al [44] Larry B Silver at al [42]Suman Khurana et al [45] Suchdev et al [37] Karande et al [34].

High association of Axis I psychiatric disorders are also reported in scholastic backward children. Axis I problems were present in 42% and Axis II in 34%. Among Axis I conduct disorder was more reported in a study O somasundaram et al [8] Jyothsna Akam Venkata,[68]. Such association was not found in this study.

Various Chinese studies and western studies [36] also gave similar reports like the present study Handwerk et al [65].

The behavioural and emotional problems in a child most often go unnoticed, until this causes significant impairment in the functioning of the child which is difficult to assess. Most often these problems may be seen as the variant of temperamental problems in a child. Unless we sit and talk with the child in detail, the child would not come out with exact problems. Many a times the externalizing behavioral problems make the teacher to report to parents. Sometimes the parents themselves find difficulty in managing the externalizing problems and seek medical help. This leads to high false reporting of externalizing problems when compared to other internalizing problems, which were actually presumed by the parents and teachers as normal laziness and dullness. Previous

studies analysed these children with emotional and behavioural problems retrospectively shenoy et al [1] and found that, 26% of these children had scholastic problems.

While one hypothesis says that, educational failure causes emotional problems and conduct disturbances. [Rutter et al 1970], another review favours common cause for both of these disorders. Further future studies are needed to examine this association, and the need for addressing and managing these psychological problems along with the remediation of scholastic difficulties to be highlighted.

The co morbidity of reading disorder with disorders of written expression was found in this study which was also reported in previous studies Sunil Karande et al [86] Erik G Willicutt et al [63].

Co morbid ADHD and ODD problems with SLD in this study were favoured by Jyothsna Akam Venkata [68] [74].

Verbal &performance IQ and other cognitive functions

Comparison between the three groups on intellectual functioning indicates that children with SLD had significantly lower scores on all the subtypes of verbal and performance IQ. The three groups differed significantly both within groups and between groups in all the subsets of verbal IQ.

The Vocabulary and Arithmetic and digitspan subsets have low scores which contributed to overall low verbal IQ in SLD children.

Vocabulary, Comprehension, Information subsets - which assesses the language functions, showed impaired functions in these domains in SLD children.

Digit span- which reflects the attention, immediate memory were also impaired in children with SLD.

The performance IQ scores in all the subsets were above 84. And overall performance scores were more than verbal scores in all the three groups, more difference being seen in SLD group. This is against the previous studies in Indian children who had more verbal IQ than performance IQ. It was reported that Western children did well in performance tests than verbal. But in this study the results could be explained by the change in educational system which was activity oriented with more play materials, giving a good performance IQ.

Object Assembly, Picture completion, Block design - which assesses the visuo perceptual functioning also impaired in children with SLD.

Mazes, Analogies and similarities - assesses the reasoning and problem solving abilities of the child are also impaired in children with SLD.

Coding which assesses the cognitive or mental speed is also slow in SLD children. The three groups differed significantly both within groups and between groups in all the domains except SFBT 3. Motor speed assessed by the SFBT is also slow in children in SLD

There was significant difference between the groups and within the groups. 'The lower verbal score is mainly attributed by low vocabulary and arithmetic skills, whereas the comprehension part is fairly good in SLD children' was reported by previous studies by Kohli, Vinod Kumar Bhasi. [33]

Processing speed, verbal comprehension, perceptual organization, and working memory are also significantly impaired in SLD children Karande et al, [34] Sprean O et al [36] Suchdev at al [37].

In this study the verbal working memory was significantly impaired in SLD children when compared with other 2 groups and there was significant association with the n back 1 and n back 2 scores, more significance was seen with n back 2.This finding was supported by previous studies like Vasic et al[67] Beneventi et al [56] [51] reports that

there are no pathognomonic neurological findings in children with SLD, but there may be presence of soft neurological signs and milder asymmetries of tone [13].

CONCLUSION

To conclude scholastic backwardness in children is a complex issue, having various causes. Each child's problem is unique in nature. As the age advances nature of psychological problems which interfere with learning process varies. In preprimary and primary students hyperkinetic disorders were predominant. This interfered with school going, behaviour in classroom and attention in the study. The SDDSS were manifested during the primary and upper primary level. In upper primary level the main issue was behavioural disorders. Family dynamics and socio demographic background also plays a major role in the learning process impaired cognitive functions and verbal working memory were seen in these children with learning disorders, which plays a crucial role in remediation. All these factors have to be considered while designing intervention strategies. Multiple diagnoses were another issue in children with poor scholastic performance. Children with severe degree of poor scholastic performance had more psychological problems. Scholastic backwardness and behavioural and emotional problems in the children are interrelated reciprocally.

So when a child is brought with complaints of poor scholastic performance, he/she should be analyzed in a detailed manner including

his behaviour, learning behaviour, family dynamics and the resources that he had. Intervention strategies can be designed accordingly**.**

The application of scientifically-based interventions to this problem is essential in ameliorating the lifelong effects of this disability. It is vitally important that students with specific learning disorders are identified early and receive these types of interventions.

Issues emerging from this study

- Children with scholastic backwardness should be subjected to detailed assessment including IQ and SLD battery.
- Emotional and behavioural problems of these children should be addressed
- Cognitive functions in every child with SLD should be done, inorder to plan, streamline and individualize the remediation programme to get the better results.
- Class teachers should be psycho educated about the SLD and associated behavioural and emotional problems, if possible during their monthly meeting in SSA.
- There is an imminent need for construction of Screening tool in Tamil, so that, it can be incorporated into the school health survey.

- The duties of special educator is under utilized. The identified children should be actively encouraged consistently and enrolled in remedial programmes.
- Awareness programmes, workshops and CME should be conducted periodically for teachers, parents.
- Governments of Maharashtra, Tamil Nadu have granted children with SLD to avail the benefits in NIOS syllabus and especially for those children in vernacular medium there is non-availability of the benefits ,which should be taken into consideration in future.

LIMITATIONS

Even though this is a community study because of small sample prevalence could not be reported.

Parents are not interviewed and so many other biological and developmental issues like birth and developmental history, and perinatal problems were not clarified.

Family dynamics like, marital disharmony, order of birth and no of siblings Parenting styles are not studied.

The intervention strategies were not taken into account.

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Appendix A

க.து.ந.க.எண்.அ3/ 11386/2014

சென்னை மாநகராட்சி
கல்வித்துறை
நாள் : .06.2014

சென்னை மாநகராட்சி கல்வி அலுவலர்(பொறுப்பு) அவர்களின் செயல்முறை ஆணை செ–3

முன்னிலை: திரு.P. பேரின்பராஜ், பி.எஸ்சி, எம்.ஏ, எம்.எட், எம்.பில்,

****

பொருள்: சென்னை மாநகராட்சி – கல்வித்துறை – இயக்குனர், இன்ஸ்டியுட் ஆப் மெண்டல் எல்த், கீழ்பாக்கம், சென்னை –10 – சென்னை பள்ளிகளில் 9–10 வது மாணவ/மாணவியர்கள் குறித்த ஆராய்ச்சி கட்டுரை மேற்கொள்வதற்கு அனுமதி வழங்குவது – சம்மந்தமாக.

படிக்க: இயக்குநர், இன்ஸ்டியுட் ஆப் மெண்டல் எல்த் கீழ்பாக்கம், சென்னை –10 அவர்களின் 27.03.2014 நாளிட்ட கடிதம்.

****

பார்வையில் கண்டுள்ள கடிதத்தின்படி சென்னை மாநகராட்சி கல்வித்துறை இயக்குநர், இன்ஸ்டியுட் ஆப் மெண்டல் எல்த் கீழ்பாக்கம், சென்னை –10 அவர்களின் கடிதத்தில் மருத்துவ முதுகலை பட்டதாரி 3 ஆம் ஆண்டு பயிலும் டாக்டர் பி. மங்கையர்கரசி, சென்னை மாநகராட்சி தொடக்க மற்றும் நடுநிலைப்பள்ளிகளில் பயிலும் மாணவ/மாணவியர்களுக்கு, புரிந்து கொள்ளுதலில் குறைபாடு சேர்ந்து பழகுதல், சேர்ந்து பழகும்முறை, உணர்ச்சி வசப்படுதல், குறித்த ஆய்வு கட்டுரையை சமர்ப்பிக்க ஜூலை 2014 முதல் செப்டம்பர் 2014 வரை அனுமதி வழங்கப்படுகிறது.

பள்ளிகளின் விவரம்:

1. செ.தொ.பள்ளி, கீழ்பாக்கம்
2. செ.தொ.பள்ளி, தமிழர் நகர்
3. செ,தொ.பள்ளி, புல்லா அவென்யு
4. செ.ந.நி.பள்ளி, அமைந்தகரை
5. செ.தொ.பள்ளி, என்.எஸ்.கே. நகர்
6. செ.மே.நி.பள்ளி – செ,தொ.பள்ளி, சுப்பராயன் தெரு
7. செ.ந.நி.பள்ளி, சேத்பெட், மெக் நிகல்ஸ் சாலை
8. செ.ந.நி.பள்ளி, சிந்தாதிரிபேட்டை
9. செ.தொ.பள்ளி, நாகப்பா தெரு, புதுப்பேட்டை

எனவே, மேற்காணும் பள்ளிகளுக்கு தனியர் மாலை நேரத்தில் ஆய்வு மேற்கொள்ளவும் பள்ளி நிர்வாகப்பணிக்கு எவ்வித இடையூறும் ஏற்படாத வண்ணம் அனுமதி வழங்கப்படுகிறது.

11/6

கல்வி அலுவலர்.

Educational Officer
Corporation of Chennai
Chennai-600 003

நகல்: தலைமையாசிரியர்
மேற்காண் பள்ளிகள்

11/06/14 11/06/14 SMCA

E/back up3/a3

Please print

TEACHER'S REPORT FORM FOR AGES 6-18

For office use only
ID #

Your answers will be used to compare the pupil with other pupils whose teachers have completed similar forms. The information from this form will also be used for comparison with other information about this pupil. Please answer as well as you can, even if you lack full information. Scores on individual items will be combined to identify general patterns of behavior. Feel free to print additional comments beside each item and in the spaces provided on page 2. ***Please print, and answer all items.***

PUPIL'S FULL NAME First Middle Last

PUPIL'S GENDER ☐ Boy ☐ Girl

PUPIL'S AGE

PUPIL'S ETHNIC GROUP OR RACE

TODAY'S DATE Mo. _____ Day ____ Year _____

PUPIL'S BIRTHDATE (if known) Mo. ____ Day ____ Year ____

GRADE IN SCHOOL _____

NAME AND ADDRESS OF SCHOOL _____ _____ _____

PARENTS' USUAL TYPE OF WORK, even if not working now.
(Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.)
FATHER'S TYPE OF WORK _____
MOTHER'S TYPE OF WORK _____

THIS FORM FILLED OUT BY: (print your full name)
_____

Your gender: ☐ Male ☐ Female

Your role at the school:
☐ Classroom Teacher ☐ Counselor ☐ Teacher's Aide
☐ Special Educator ☐ Administrator ☐ Other (specify)

I. For how many months have you known this pupil? _____ months

II. How well do you know him/her? 1. ☐ Not Well 2. ☐ Moderately Well 3. ☐ Very Well

III. How much time does he/she spend in your class or service per week?

IV. What kind of class or service is it? (Please be specific, e.g., regular 5th grade, 7th grade math, learning disability, counseling, etc.)

V. Has he/she ever been referred for special class placement, services, or tutoring?
☐ Don't know 0. ☐ No 1. ☐ Yes — what kind and when?

VI. Has he/she ever repeated any grades? ☐ Don't Know 0. ☐ No 1. ☐ Yes – grades and reasons:

VII. Current academic performance — list academic subjects and check box that indicates pupil's performance for each subject:

Academic subject	1. Far below grade	2. Somewhat below grade	3. At grade level	4. Somewhat above grade	5. Far above grade
1. _____	☐	☐	☐	☐	☐
2. _____	☐	☐	☐	☐	☐
3. _____	☐	☐	☐	☐	☐
4. _____	☐	☐	☐	☐	☐
5. _____	☐	☐	☐	☐	☐
6. _____	☐	☐	☐	☐	☐

Be sure you answered all items. Then see other side.

6-1-01 Edition - 301

Please print. Be sure to answer all items.

VIII. Compared to typical pupils of the same age:	**1. Much less**	**2. Somewhat less**	**3. Slightly less**	**4. About average**	**5. Slightly more**	**6. Somewhat more**	**7. Much more**
1. How hard is he/she working?	❒	❒	❒	❒	❒	❒	❒
2. How appropriately is he/she behaving?	❒	❒	❒	❒	❒	❒	❒
3. How much is he/she learning?	❒	❒	❒	❒	❒	❒	❒
4. How happy is he/she?	❒	❒	❒	❒	❒	❒	❒

IX. Most recent achievement test scores (optional):

Name of test	Subject	Date	Percentile or grade level obtained

X. IQ, readiness, or aptitude tests (optional):

Name of test	Date	IQ or equivalent scores

Does this pupil have any illness or disability (either physical or mental)? ❒ **No** ❒ **Yes — please describe:**

What concerns you most about this pupil?

Please describe the best things about this pupil:

Please feel free to write any comments about this pupil's work, behavior, or potential, using extra pages if necessary.

Please print. Be sure to answer all items.

Below is a list of items that describe pupils. For each item that describes the pupil ***now or within the past 2 months***, please circle the ***2*** if the item is ***very true or often true*** of the pupil. Circle the ***1*** if the item is ***somewhat or sometimes true*** of the pupil. If the item is ***not true*** of the pupil, circle the ***0***. Please answer all items as well as you can, even if some do not seem to apply to this pupil.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 1. Acts too young for his/her age
0 1 2 2. Hums or makes other odd noises in class
0 1 2 3. Argues a lot
0 1 2 4. Fails to finish things he/she starts
0 1 2 5. There is very little he/she enjoys
0 1 2 6. Defiant, talks back to staff
0 1 2 7. Bragging, boasting
0 1 2 8. Can't concentrate, can't pay attention for long
0 1 2 9. Can't get his/her mind off certain thoughts; obsessions (describe): _____
_____
0 1 2 10. Can't sit still, restless, or hyperactive
0 1 2 11. Clings to adults or too dependent
0 1 2 12. Complains of loneliness
0 1 2 13. Confused or seems to be in a fog
0 1 2 14. Cries a lot
0 1 2 15. Fidgets
0 1 2 16. Cruelty, bullying, or meanness to others
0 1 2 17. Daydreams or gets lost in his/her thoughts
0 1 2 18. Deliberately harms self or attempts suicide
0 1 2 19. Demands a lot of attention
0 1 2 20. Destroys his/her own things
0 1 2 21. Destroys property belonging to others
0 1 2 22. Difficulty following directions
0 1 2 23. Disobedient at school
0 1 2 24. Disturbs other pupils
0 1 2 25. Doesn't get along with other pupils
0 1 2 26. Doesn't seem to feel guilty after misbehaving
0 1 2 27. Easily jealous
0 1 2 28. Breaks school rules
0 1 2 29. Fears certain animals, situations, or places, other than school (describe): _____
_____
0 1 2 30. Fears going to school
0 1 2 31. Fears he/she might think or do something bad
0 1 2 32. Feels he/she has to be perfect
0 1 2 33. Feels or complains that no one loves him/her
0 1 2 34. Feels others are out to get him/her
0 1 2 35. Feels worthless or inferior
0 1 2 36. Gets hurt a lot, accident-prone
0 1 2 37. Gets in many fights
0 1 2 38. Gets teased a lot
0 1 2 39. Hangs around with others who get in trouble
0 1 2 40. Hears sound or voices that aren't there (describe): _____
_____
0 1 2 41. Impulsive or acts without thinking
0 1 2 42. Would rather be alone than with others
0 1 2 43. Lying or cheating
0 1 2 44. Bites fingernails
0 1 2 45. Nervous, highstrung, or tense
0 1 2 46. Nervous movements or twitching (describe):
_____
_____
0 1 2 47. Overconforms to rules
0 1 2 48. Not liked by other pupils
0 1 2 49. Has difficulty learning
0 1 2 50. Too fearful or anxious
0 1 2 51. Feels dizzy or lightheaded
0 1 2 52. Feels too guilty
0 1 2 53. Talks out of turn
0 1 2 54. Overtired without good reason
0 1 2 55. Overweight
56. Physical problems ***without known medical cause:***
0 1 2 a. Aches or pains (***not*** stomach or headaches)
0 1 2 b. Headaches
0 1 2 c. Nausea, feels sick
0 1 2 d. Eye problems (***not*** if corrected by glasses) (describe): _____
_____
0 1 2 e. Rashes or other skin problems
0 1 2 f. Stomachaches
0 1 2 g. Vomiting, throwing up
0 1 2 h. Other (describe): _____
_____
_____

Be sure you answered all items. Then see other side.

Please print. Be sure to answer all items.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 57. Physically attacks people
0 1 2 58. Picks nose, skin, or other parts of body (describe): _____
_____
0 1 2 59. Sleeps in class
0 1 2 60. Apathetic or unmotivated
0 1 2 61. Poor school work
0 1 2 62. Poorly coordinated or clumsy
0 1 2 63. Prefers being with older children or youths
0 1 2 64. Prefers being with younger children
0 1 2 65. Refuses to talk
0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____
_____
0 1 2 67. Disrupts class discipline
0 1 2 68. Screams a lot
0 1 2 69. Secretive, keeps things to self
0 1 2 70. Sees things that aren't there (describe): _____
_____
0 1 2 71. Self-conscious or easily embarrassed
0 1 2 72. Messy work
0 1 2 73. Behaves irresponsibly (describe): _____
_____
_____
0 1 2 74. Showing off or clowning
0 1 2 75. Too shy or timid
0 1 2 76. Explosive or unpredictable behavior
0 1 2 77. Demands must be met immediately, easily frustrated
0 1 2 78. Inattentive or easily distracted
0 1 2 79. Speech problem (describe): _____
_____
0 1 2 80. Stares blankly
0 1 2 81. Feels hurt when criticized
0 1 2 82. Steals
0 1 2 83. Stores up too many things he/she doesn't need (describe): _____
_____
_____
0 1 2 84. Strange behavior (describe): _____
_____
0 1 2 85. Strange ideas (describe): _____
_____
0 1 2 86. Stubborn, sullen, or irritable
0 1 2 87. Sudden changes in mood or feelings
0 1 2 88. Sulks a lot
0 1 2 89. Suspicious
0 1 2 90. Swearing or obscene language
0 1 2 91. Talks about killing self
0 1 2 92. Underachieving, not working up to potential
0 1 2 93. Talks too much
0 1 2 94. Teases a lot
0 1 2 95. Temper tantrums or hot temper
0 1 2 96. Seems preoccupied with sex
0 1 2 97. Threatens people
0 1 2 98. Tardy to school or class
0 1 2 99. Smokes, chews, or sniffs tobacco
0 1 2 100. Fails to carry out assigned tasks
0 1 2 101. Truancy or unexplained absence
0 1 2 102. Underactive, slow moving, or lacks energy
0 1 2 103. Unhappy, sad, or depressed
0 1 2 104. Unusually loud
0 1 2 105. Uses drugs for nonmedical purposes (***don't*** include tobacco) (describe): _____
_____
_____
0 1 2 106. Overly anxious to please
0 1 2 107. Dislikes school
0 1 2 108. Is afraid of making mistakes
0 1 2 109. Whining
0 1 2 110. Unclean personal appearance
0 1 2 111. Withdrawn, doesn't get involved with others
0 1 2 112. Worries
113. Please write in any problems the pupil has that were not listed above:
0 1 2 _____
0 1 2 _____
0 1 2 _____

Please be sure you answered all items.

CBCL/6-18 Profile for Girls — Syndrome Scales

Name_____

ID#_____

Age_____

Date CBCL filled out:

_____

CBCL filled out by:

_____

Computations

Scale I _____

II _____

+ III _____ T

Internal (a) ☐ ☐

Scale VII _____

+ VIII _____ T

External (b) ☐ ☐

Scale IV _____

V _____

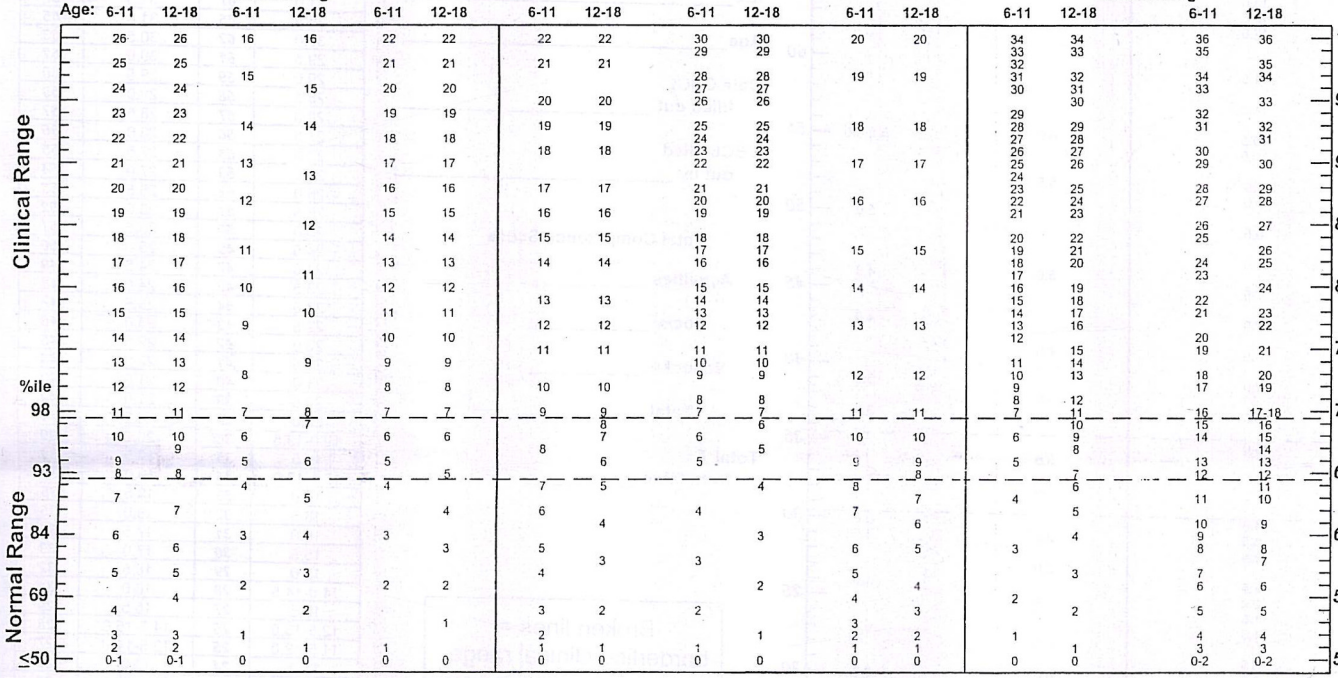
VI _____

+ Other Probs _____

(c) ☐

Sum (a) + (b) + (c): T

Total ☐ ☐



Internalizing			Externalizing			Total Score		
6-11	12-18	T	6-11	12-18	T	6-11	12-18	T
64	64	100	70	70	100	238-240	237-240	100
62-63	63	99	69	69	99	232-237	230-236	99
60-61	62	98	67-68	68	98	226-231	224-229	98
58-59	61	97	66	67	97	220-225	217-223	97
56-57	60	96	65	66	96	214-219	210-216	96
54-55	59	95	64	65	95	209-213	203-209	95
52-53	58	94	62-63	64	94	203-208	197-202	94
50-51	57	93	61	63	93	197-202	190-196	93
48-49	56	92	60	62	92	191-196	183-189	92
46-47	55	91	58-59	61	91	185-190	177-182	91
44-45	54	90	57	60	90	179-184	170-176	90
42-43	53	89	56	59	89	174-178	164-169	89
41	51-52	88	54-55	57-58	88	168-173	159-163	88
40	50	87	52-53	55-56	87	162-167	155-158	87
38-39	48-49	86	50-51	54	86	156-161	150-154	86
37	46-47	85	48-49	52-53	85	150-155	145-149	85
36	45	84	46-47	51	84	144-149	141-144	84
35	43-44	83	44-45	49-50	83	139-143	136-140	83
34	42	82	42-43	47-48	82	133-138	131-135	82
33	40-41	81	40-41	46	81	127-132	127-130	81
31-32	38-39	80	39	44-45	80	121-126	122-126	80
30	37	79	37-38	42-43	79	115-120	117-121	79
29	35-36	78	35-36	41	78	109-114	113-116	78
28	34	77	33-34	39-40	77	103-108	108-112	77
27	32-33	76	31-32	37-38	76	98-102	103-107	76
26	31	75	29-30	36	75	92-97	99-102	75
25	29-30	74	27-28	34-35	74	86-91	94-98	74
23-24	27-28	73	25-26	33	73	80-85	89-93	73
22	26	72	23-24	31-32	72	74-79	85-88	72
21	24-25	71	21-22	29-30	71	68-73	80-84	71
20	22-23	70	20	27-28	70	63-67	71-79	70
19	20-21	69		24-26	69	60-62	69-70	69
18	19	68	19	21-23	68	58-59	63-68	68
17	18	67	18	20	67	55-57	56-62	67
16	17	66	17	18-19	66	54	51-55	66
15	16	65	16	17	65	52-53	47-50	65
14	15	64	15	16	64	49-51	45-46	64
13	14	63		15	63	45-48	43-44	63
12	13	62	14	14	62	42-44	40-42	62
11		61	13	13	61	41	38-39	61
	12	60	12	12	60	38-40	36-37	60
10	11	59	11	11	59	35-37	35	59
9	10	58	10	10	58	34	33-34	58
8	9	56	9		57	32-33	30-32	57
	8	55	8	9	56	30-31	29	56
7		54		8	55	29	26-28	55
	7	53	7	7	54	26-28	24-25	54
6	6	52	6		53	24-25	23	53
5	5	50		6	52	23	21-22	52
4	4	48	5	5	51	21-22	19-20	51
3		46	4	4	49	19-20	17-18	50
	3	45	3		47	17-18	16	49
2	2	43		3	46	16	14-15	48
1	1	39	2	2	44	15	13	47
0	0	33	1		41	13-14	12	46
				1	40	12	10-11	45
			0	0	34	11	9	44
						10		43
						9	8	42
						8	7	41
						7	6	40
						6		39
						5	5	38
							4	37
						4		36
							3	35
						3		34
						2	2	32
						1	1	29
						0		25
							0	24

I. ANXIOUS/DEPRESSED

- ___ 14. Cries a lot
- ___ 29. Fears
- ___ 30. Fears school
- ___ 31. Fears doing bad
- ___ 32. Must be perfect
- ___ 33. Feels unloved
- ___ 35. Feels worthless
- ___ 45. Nervous
- ___ 50. Fearful
- ___ 52. Feels too guilty
- ___ 71. Self-conscious
- ___ 91. Talks of suicide
- ___ 112. Worries
- ___ *Total*

II. WITHDRAWN/DEPRESSED

- ___ 5. Enjoys little
- ___ 42. Rather be alone
- ___ 65. Won't talk
- ___ 69. Secretive
- ___ 75. Shy, timid
- ___ 102. Lacks energy
- ___ 103. Sad
- ___ 111. Withdrawn
- ___ *Total*

III. SOMATIC COMPLAINTS

- ___ 47. Nightmares
- ___ 49. Constipated
- ___ 51. Feels dizzy
- ___ 54. Overtired
- ___ 56a. Aches
- ___ 56b. Headaches
- ___ 56c. Nausea
- ___ 56d. Eye probs.
- ___ 56e. Skin probs.
- ___ 56f. Stomach
- ___ 56g. Vomiting
- ___ *Total*

IV. SOCIAL PROBLEMS

- ___ 11. Dependent
- ___ 12. Lonely
- ___ 25. Doesn't get along
- ___ 27. Jealous
- ___ 34. Others out to get her
- ___ 36. Accident-prone
- ___ 38. Gets teased
- ___ 48. Not liked
- ___ 62. Clumsy
- ___ 64. Prefers younger kids
- ___ 79. Speech prob.
- ___ *Total*

V. THOUGHT PROBLEMS

- ___ 9. Can't get mind off thoughts
- ___ 18. Harms self
- ___ 40. Hears things
- ___ 46. Twitching
- ___ 58. Picks skin
- ___ 59. Sex parts public
- ___ 60. Sex parts too much
- ___ 66. Repeats acts
- ___ 70. Sees things
- ___ 76. Sleeps less
- ___ 83. Stores things
- ___ 84. Strange behavior
- ___ 85. Strange ideas
- ___ 92. Sleep talks/walks
- ___ 100. Trouble sleeping
- ___ *Total*

VI. ATTENTION PROBLEMS

- ___ 1. Acts young
- ___ 4. Fails to finish
- ___ 8. Can't concentrate
- ___ 10. Can't sit still
- ___ 13. Confused
- ___ 17. Daydreams
- ___ 41. Impulsive
- ___ 61. Poor schoolwork
- ___ 78. Inattentive
- ___ 80. Stares
- ___ *Total*

VII. RULE-BREAKING BEHAVIOR

- ___ 2. Drinks alcohol
- ___ 26. Lacks guilt
- ___ 28. Breaks rules
- ___ 39. Bad friends
- ___ 43. Lies, cheats
- ___ 63. Prefers older kids
- ___ 67. Runs away
- ___ 72. Sets fires
- ___ 73. Sex problems
- ___ 81. Steals at home
- ___ 82. Steals outside home
- ___ 90. Swearing
- ___ 96. Thinks of sex too much
- ___ 99. Uses tobacco
- ___ 101. Truant
- ___ 105. Uses drugs
- ___ 106. Vandalism
- ___ *Total*

VIII. AGGRESSIVE BEHAVIOR

- ___ 3. Argues a lot
- ___ 16. Mean
- ___ 19. Demands attention
- ___ 20. Destroys own things
- ___ 21. Destroys others' things
- ___ 22. Disobedient at home
- ___ 23. Disobedient at school
- ___ 37. Gets in fights
- ___ 57. Attacks people
- ___ 68. Screams a lot
- ___ 86. Stubborn, sullen
- ___ 87. Mood changes
- ___ 88. Sulks
- ___ 89. Suspicious
- ___ 94. Teases a lot
- ___ 95. Temper
- ___ 97. Threatens others
- ___ 104. Loud
- ___ *Total*

OTHER PROBLEMS

- ___ 6. BM out of toilet
- ___ 7. Brags
- ___ 15. Cruel to animals
- ___ 24. Doesn't eat well
- ___ 44. Bites nails
- ___ 53. Overeating
- ___ 55. Overweight
- ___ 56h. Other physical problems
- ___ 74. Shows off
- ___ 77. Sleeps more
- ___ 93. Talks too much
- ___ 98. Thumbsucking
- ___ 107. Wets self (day)
- ___ 108. Wets the bed
- ___ 109. Whining
- ___ 110. Wishes to be opposite sex
- ___ 113. Other problems
- ___ *Total*

Broken lines = borderline clinical range

CBCL/6-18 PROFILE FOR BOYS — SYNDROME SCALES

Name_____

ID#_____

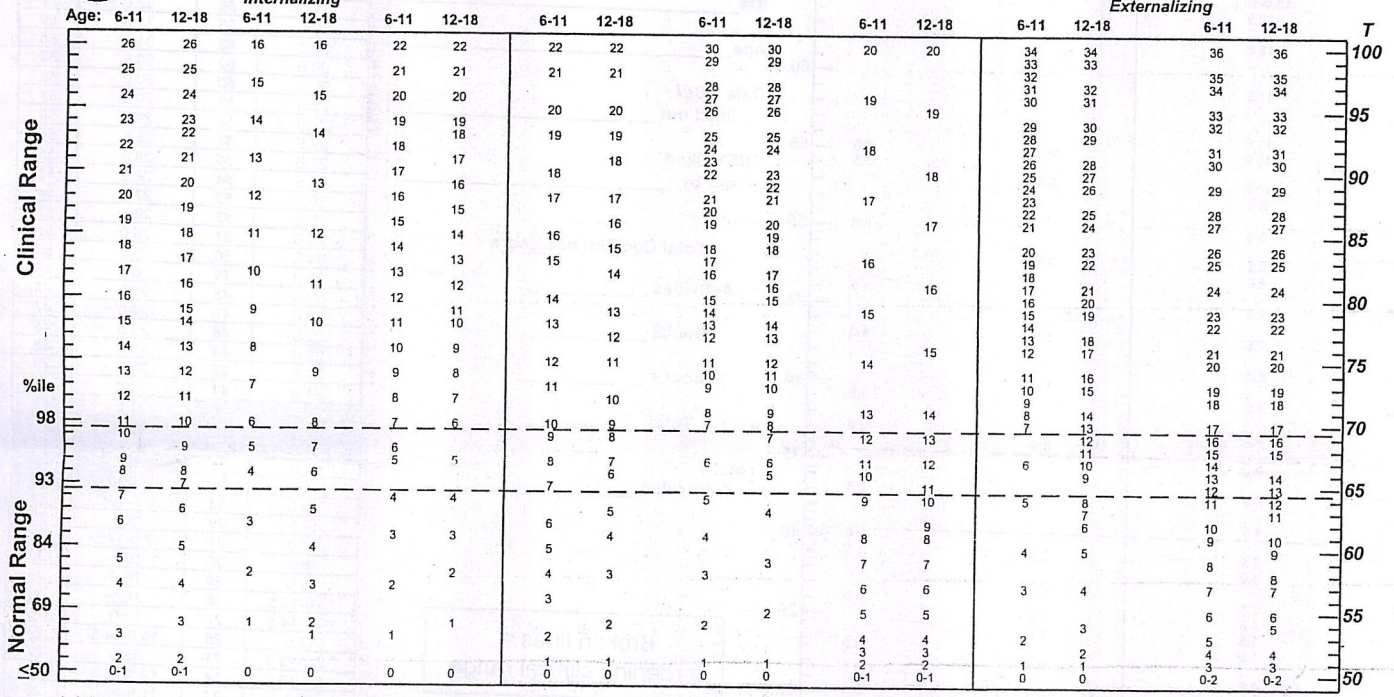
Age_____

Date CBCL filled out:

_____

CBCL filled out by:

_____



Computations

Scale I ____
II ____
+ III ____ T

Internal (a) ☐ ☐

Scale VII ____
+ VIII ____ T

External (b) ☐ ☐

Scale IV ____
V ____
VI ____
+ Other Probs ____
(c) ☐

Sum (a) + (b) + (c): T

Total ☐ ☐

I. ANXIOUS/ DEPRESSED
- ___ 14. Cries a lot
- ___ 29. Fears
- ___ 30. Fears school
- ___ 31. Fears doing bad
- ___ 32. Must be perfect
- ___ 33. Feels unloved
- ___ 35. Feels worthless
- ___ 45. Nervous
- ___ 50. Fearful
- ___ 52. Feels too guilty
- ___ 71. Self-conscious
- ___ 91. Talks of suicide
- ___ 112. Worries
- ___ *Total*

II. WITHDRAWN/ DEPRESSED
- ___ 5. Enjoys little
- ___ 42. Rather be alone
- ___ 65. Won't talk
- ___ 69. Secretive
- ___ 75. Shy, timid
- ___ 102. Lacks energy
- ___ 103. Sad
- ___ 111. Withdrawn
- ___ *Total*

III. SOMATIC COMPLAINTS
- ___ 47. Nightmares
- ___ 49. Constipated
- ___ 51. Feels dizzy
- ___ 54. Overtired
- ___ 56a. Aches
- ___ 56b. Headaches
- ___ 56c. Nausea
- ___ 56d. Eye probs.
- ___ 56e. Skin probs.
- ___ 56f. Stomach
- ___ 56g. Vomiting
- ___ *Total*

IV. SOCIAL PROBLEMS
- ___ 11. Dependent
- ___ 12. Lonely
- ___ 25. Doesn't get along
- ___ 27. Jealous
- ___ 34. Others out to get him
- ___ 36. Accident-prone
- ___ 38. Gets teased
- ___ 48. Not liked
- ___ 62. Clumsy
- ___ 64. Prefers younger kids
- ___ 79. Speech prob.
- ___ *Total*

V. THOUGHT PROBLEMS
- ___ 9. Can't get mind off thoughts
- ___ 18. Harms self
- ___ 40. Hears things
- ___ 46. Twitching
- ___ 58. Picks skin
- ___ 59. Sex parts public
- ___ 60. Sex parts too much
- ___ 66. Repeats acts
- ___ 70. Sees things
- ___ 76. Sleeps less
- ___ 83. Stores things
- ___ 84. Strange behavior
- ___ 85. Strange ideas
- ___ 92. Sleep talks/walks
- ___ 100. Trouble sleeping
- ___ *Total*

VI. ATTENTION PROBLEMS
- ___ 1. Acts young
- ___ 4. Fails to finish
- ___ 8. Can't concentrate
- ___ 10. Can't sit still
- ___ 13. Confused
- ___ 17. Daydreams
- ___ 41. Impulsive
- ___ 61. Poor schoolwork
- ___ 78. Inattentive
- ___ 80. Stares
- ___ *Total*

VII. RULE-BREAKING BEHAVIOR
- ___ 2. Drinks alcohol
- ___ 26. Lacks guilt
- ___ 28. Breaks rules
- ___ 39. Bad friends
- ___ 43. Lies, cheats
- ___ 63. Prefers older kids
- ___ 67. Runs away
- ___ 72. Sets fires
- ___ 73. Sex problems
- ___ 81. Steals at home
- ___ 82. Steals outside home
- ___ 90. Swearing
- ___ 96. Thinks of sex too much
- ___ 99. Uses tobacco
- ___ 101. Truant
- ___ 105. Uses drugs
- ___ 106. Vandalism
- ___ *Total*

VIII. AGGRESSIVE BEHAVIOR
- ___ 3. Argues a lot
- ___ 16. Mean
- ___ 19. Demands attention
- ___ 20. Destroys own things
- ___ 21. Destroys others' things
- ___ 22. Disobedient at home
- ___ 23. Disobedient at school
- ___ 37. Gets in fights
- ___ 57. Attacks people
- ___ 68. Screams a lot
- ___ 86. Stubborn, sullen
- ___ 87. Mood changes
- ___ 88. Sulks
- ___ 89. Suspicious
- ___ 94. Teases a lot
- ___ 95. Temper
- ___ 97. Threatens others
- ___ 104. Loud
- ___ *Total*

OTHER PROBLEMS
- ___ 6. BM out of toilet
- ___ 7. Brags
- ___ 15. Cruel to animals
- ___ 24. Doesn't eat well
- ___ 44. Bites nails
- ___ 53. Overeating
- ___ 55. Overweight
- ___ 56h. Other physical problems
- ___ 74. Shows off
- ___ 77. Sleeps more
- ___ 93. Talks too much
- ___ 98. Thumbsucking
- ___ 107. Wets self (day)
- ___ 108. Wets the bed
- ___ 109. Whining
- ___ 110. Wishes to be opposite sex
- ___ 113. Other problems
- ___ *Total*

Broken lines = borderline clinical range

Internalizing 6-11	12-18	*T*	*Externalizing* 6-11	12-18	*T*	*Total Score* 6-11	12-18	*T*
64	64	*100*	70	70	*100*	238-240	237-240	*100*
63	62-63	*99*	69	69	*99*	232-237	230-236	*99*
62	61	*98*	68	68	*98*	226-231	223-229	*98*
60-61	59-60	*97*	67	67	*97*	221-225	217-222	*97*
59	58	*96*	66	66	*96*	215-220	210-216	*96*
58	57	*95*	65	65	*95*	210-214	203-209	*95*
57	55-56	*94*	64	64	*94*	204-209	196-202	*94*
56	54	*93*	63	63	*93*	198-203	189-195	*93*
54-55	52-53	*92*	62	62	*92*	193-197	183-188	*92*
53	51	*91*	61	61	*91*	187-192	176-182	*91*
52	49-50	*90*	60	60	*90*	181-186	169-175	*90*
51	48	*89*	59	59	*89*	175-180	163-168	*89*
49-50	46-47	*88*	57-58	57-58	*88*	169-174	158-162	*88*
47-48	45	*87*	55-56	55-56	*87*	163-168	154-157	*87*
46	44	*86*	53-54	54	*86*	157-162	149-153	*86*
44-45	42-43	*85*	51-52	52-53	*85*	151-156	144-148	*85*
42-43	41	*84*	49-50	51	*84*	145-150	139-143	*84*
41	40	*83*	47-48	49-50	*83*	139-144	135-138	*83*
39-40	38-39	*82*	45-46	47-48	*82*	133-138	130-134	*82*
37-38	37	*81*	43-44	46	*81*	127-132	125-129	*81*
35-36	36	*80*	41-42	44-45	*80*	121-126	121-124	*80*
34	34-35	*79*	39-40	42-43	*79*	114-120	116-120	*79*
32-33	33	*78*	37-38	41	*78*	108-113	111-115	*78*
30-31	31-32	*77*	35-36	39-40	*77*	102-107	106-110	*77*
29	30	*76*	33-34	37-38	*76*	96-101	102-105	*76*
27-28	29	*75*	31-32	36	*75*	90-95	97-101	*75*
25-26	27-28	*74*	29-30	34-35	*74*	84-89	92-96	*74*
24	26	*73*	27-28	33	*73*	78-83	87-91	*73*
22-23	25	*72*	25-26	31-32	*72*	72-77	83-86	*72*
20-21	23-24	*71*	23-24	29-30	*71*	66-71	78-82	*71*
18-19	20-22	*70*	22	28	*70*	61-65	71-77	*70*
	18-19	*69*	21	25-27	*69*	59-60	68-70	*69*
16-17	17	*68*	20	23-24	*68*	57-58	66-67	*68*
15	16	*67*	19	22	*67*	56	64-65	*67*
14	15	*66*	18	20-21	*66*	54-55	61-63	*66*
12-13	14	*65*	17		*65*	50-53	58-60	*65*
11	13	*63*	16	19	*64*	49	52-57	*64*
10	12	*62*	15	17-18	*63*	47-48	49-51	*63*
9	11	*61*	14	16	*62*	44-46	47-48	*62*
	10	*59*	12	14	*60*	39-40	40-43	*60*
8	9	*58*	10-11	13	*59*	37-38	38-39	*59*
7	8	*57*		12	*58*	35-36	35-37	*58*
	7	*55*	9	11	*57*	34	33-34	*57*
6	6	*54*	8	10	*56*	32-33	30-32	*56*
5	5	*52*	7	9	*55*	30-31	28-29	*55*
4	4	*50*		8	*54*	28-29	26-27	*54*
3		*48*	6	7	*53*	25-27	24-25	*53*
	3	*47*	5	6	*51*	24	22-23	*52*
2		*45*	4	5	*50*	21-23	20-21	*51*
	2	*44*	3	4	*48*	19-20	19	*50*
1		*41*		3	*46*	17-18	17-18	*49*
	1	*40*	2		*44*	16	16	*48*
0	0	*34*		2	*43*	15	14-15	*47*
			1	1	*40*	14	13	*46*
				0	*34*	12-13	11-12	*45*
			0		*33*	11	10	*44*
						10	9	*43*
						9	8	*42*
						8	7	*41*
						7	6	*40*
						6		*39*
						5	5	*38*
							4	*37*
						4		*36*
						3	3	*34*
						2	2	*31*
							1	*27*
						1		*26*
						0	0	*24*

NIMHANS INDEX OF SPECIFIC LEARNING DISABILITIES

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1991

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II. READING:

1. இது ஒரு பெரிய மரம். இது ஒரு மாமரம்.

2. இவை மாம்பழங்கள்.

3. இது ரோஜா செடி. இது ஒரு ரோஜாப்பூ.

4. இது ஒரு இலை. இது சிறியது.

5. இவை சிறிய இலைகள்.

6. இவை ரோஜா செடிகள். இவை ரோஜாப்பூக்கள்.

7. இவை சிவப்பு ரோஜாக்கள்

8. இவை மஞ்சள் ரோஜாக்கள்

ஒரு ஆற்றங்கரையில் உள்ள மரத்தில் குரங்கு ஒன்று வாழ்த்து வந்தது. அந்த ஆற்றில் ஒரு முதலை இருந்தது. ஒரு நாள் முதலை மரத்தின் அருகே வந்தபோது குரங்கு சுவையான பழத்தை சாப்பிட்கொண்டு இருப்பதைப் பார்த்தது. முதலைக்கு மிகவும் பசியாக இருந்ததால் அது குரங்கிடம் 'தயவு செய்து எனக்கும் சாப்பிட கொஞ்சம் பழங்களைத் தருவாயா?' எனக் கெஞ்சிக்கேட்டது.

குரங்கும் முதலையின் வேண்டுக்கோளுக்கு மனமிறங்கி கொஞ்சம் பழங்களை பறித்து தூக்கி முதலையிடம் போட்டது. அந்த பழங்களைச் சாப்பிட்ட முதலை குரங்கிற்கு நன்றியைத் தெரிவித்தது. வெகு விரைவில் இருவரும் நல்ல நண்பர்கள் ஆனார்கள். இருவரும் சேர்ந்தே, பழங்களைச் சாப்பிட்டார்கள். ஒரு நாள் அடுத்த கரையில் உள்ள முதலையின் மனைவிக்கு கொஞ்சம் பழங்களை எடுத்து செல்ல யோசனை கூறியது.

3. Spelling Test

1. பானை
2. குடிசை
3. அரசன்
4. தந்தை
5. கடவுள்
6. ஆலமரம்
7. மகிழ்ச்சி
8. பொங்கல்
9. மருத்துவர்
10. விளையாட்டு
11. செல்வம்
12. சிலம்பாட்டம்
13. குதிரை
14. நாளிதழ்
15. வண்ணத்துப்பூச்சி

Record Form

Malin Intelligence Scale For Indian Children (MISIC)

NAME.....SEX.....

ADDRESS.....

FATHER'S NAME.....MOTHER'S NAME.....

SCHOOL.....CLASS.....

	YEAR	MONTH	DAY
Date tested	.....	.....	.....
Date of Birth	.....	.....	.....
Age	.....	.....	.....

	RAW SCORE	1.Q.
Verbal Scale	.....	.....
Performance Scale	.....	.....
Total	.....	.....

VERBAL TABLE	Raw Score	1.Q.
Information	.....	.....
Comprehension	.....	.....
Arithmetic	.....	.....
Vocabulary	.....	.....
(Digit Span)	.....	.....
Sum of Verbal Tests	.....	.....

PERFORMACNE TEST	Raw Score	1.Q.
Picture Completion	.....	.....
Block Assembly	.....	.....
Object Assembly	.....	.....
Mazes	.....	.....
	.....	.....
Sum of Performance Test	.....	

1. INFORMATION TEST

	Response Score		Response Scare
1.	.....	16.	.....
2.	.....	17.	.....
3.	.....	18.	.....
4.	.....	19.	.....
5.	.....	20.	.....
6.	.....	21.	.....
7.	.....	22.	.....
8.	.....	23.	.....
9.	.....	24.	.....
10.	.....	25.	.....
11.	.....	26.	.....
12.	.....	27.	.....
13.	.....	28.	.....
14.	.....	29.	.....
15.	.....	30.	.....

VI. DIGIT SPAN

FORWARDS

	Response	Score
3. a)	.....	
b)	.....	
4. a)	.....	
b)	.....	
5. a)	.....	
b)	.....	
6. a)	.....	
b)	.....	
7. a)	.....	
b)	.....	

BACKWARD

	Response	Score
2. a)	.....	
b)	.....	
3. a)	.....	
b)	.....	
4. a)	.....	
b)	.....	
5. a)	.....	
b)	.....	
6. a)	.....	
b)	.....	

V. VOCABULARY TEST

	Response	Score
1.	.....	
2.	.....	
3.	.....	
4.	.....	
5.	.....	
6.	.....	
7.	.....	
8.	.....	
9.	.....	
10.	.....	
11.	.....	
12.	.....	
13.	.....	
14.	.....	
15.	.....	
16.	.....	
17.	.....	
18.	.....	
19.	.....	
20.	.....	

	Response	Score
21.	.....	
22.	.....	
23.	.....	
24.	.....	
25.	.....	
26.	.....	
27.	.....	
28.	.....	
29.	.....	
30.	.....	
31.	.....	
32.	.....	
33.	.....	
34.	.....	
35.	.....	
36.	.....	
37.	.....	
38.	.....	
39.	.....	
40.	.....	

N Back Task, (Verbal) For Verbal Working Memory

List of Phonemes

1 Back

Ga	Ta
Ja	Cha
Ja	Ra
Cha	Va
Ksha	Va
Ksha	Ga
Ra	Da
Na	Da
Ma	Ra
Ma	Na
Ka	Sha
Pa	Sha
Pa	Ga
La	Va
Va	Va
Ta	

2 back

Na	Dha	Pa	Na
Ga	Ba	Sa	Ka
Na	Dha	Pa	La
Ma	Va	Ra	Dha
Na	Sha	Pa	Cha
Ma	Va	Ra	Dha
Ka	Ga	Sa	Cha
Ma	Da	Ta	Sa
Ka	Na	Da	La
La	Da	Ta	
Tha	Cha	La	
Ja	Ra	Ha	
ya	Sha	Va	
Ja	Ja	Ha	
Va	Sha	Ja	

Note: The underlined items are the target responses (Hits).

SlNo		Age	Sex	Fath surv	Fat Edn	Fat Occup	Fat alcho	Moth surv	Moth Edn	Moth occu	Home teach	TV watch	SI Attend	Affective	Anxiety	Somatic	ADHD	ODD	Conduct	Verbal IQ	Permo IQ	Total IQ	SFBT 1	SFBT 2	SFBT 3	SFBT Total	Reading	Writing	R&W Group	Arithmetic	N back 1	N back 2
1	1	10	1	1	2	2	1	1	3	2	2	3	1	4	2	0	10	0	0	92.8	96.4	94.6	14.2	14.6	12	40.8	1	1	1	1	8	17
2	1	10	1	1	3	2	1	1	2	2	5	2	1	2	0	3	0	0	0	92	98	95	19	18.1	16	53.1	1	1	1	1	8	16
3	1	10	2	2	3	2	1	1	2	2	3	2	1	2	4	0	0	0	0	100	102.2	101.1	16.8	16	14	46.8	1	1	1	1	9	17
4	1	10	1	1	2	1	1	1	1	2	5	3	1	0	0	3	18	6	0	87	96.8	91.9	18.4	16	18.2	52.6	1	1	1	1	8	15
5	1	10	1	1	2	2	2	1	2	1	2	2	2	5	1	0	6	0	0	100.4	103.4	101.9	14.1	11.7	14	39.8	1	1	1	1	9	17
6	1	10	1	1	3	2	1	1	2	1	3	3	1	0	0	2	16	6	0	97.8	98.8	98.3	19	16.2	16.1	51.3	1	1	1	1	8	17
7	1	10	2	1	3	2	1	1	3	1	4	2	1	0	0	0	6	0	0	97	100.2	98.6	16.7	14.2	14	44.9	1	1	1	1	8	15
8	1	10	2	1	2	2	2	1	3	1	5	3	2	0	0	0	0	4	4	102.5	99	100.8	19.8	16	14.4	50.2	1	1	1	1	7	15
9	1	10	2	1	3	2	1	1	3	1	5	2	2	9	4	4	0	0	0	88.8	92.6	90.7	20	17.1	14.2	51.3	1	1	1	1	8	17
10	1	10	1	1	2	1	2	1	2	2	5	2	2	8	2	2	14	0	0	94.3	92.8	93.6	14.6	12	13.4	40	1	1	1	1	8	16
11	1	10	1	1	2	2	1	2	2	1	5	3	2	0	0	0	5	2	0	97	96.6	96.8	17	17.7	16.3	51	1	1	1	1	8	16
12	1	10	2	1	3	3	2	1	3	2	5	3	1	5	3	0	8	0	0	97.8	100.2	99	14.1	11	14	39.1	1	1	1	1	7	14
13	1	10	1	2	3	2	1	1	2	1	3	2	1	0	0	6	0	0	0	99	95	97	19	18.8	17	54.8	1	1	1	1	8	16
14	1	10	2	1	2	1	1	1	3	1	2	2	1	5	3	0	0	0	0	85.8	92.6	89.2	15.6	16	17	48.6	1	1	1	1	9	17
15	1	10	2	1	3	1	1	1	2	1	2	2	1	6	4	0	0	0	8	105.8	110	107.9	16.8	17	14	47.8	1	1	1	1	8	17
16	1	10	1	1	3	1	2	1	3	1	1	3	1	0	0	3	10	8	0	95.8	95.4	95.6	14.1	11.7	13	38.8	1	1	1	1	9	17
17	1	10	1	1	2	1	2	1	3	1	1	3	1	8	0	0	6	7	0	100.2	95.8	98	14.1	15	14	43.1	1	1	1	1	8	16
18	1	10	2	1	2	1	1	1	2	1	1	3	1	4	0	2	19	0	0	97	95	96	20	17.8	16	53.8	1	1	1	1	8	15
19	1	10	2	1	2	2	1	1	2	1	5	2	1	2	0	0	6	9	9	100.4	97.6	99	17	17.7	16.3	51	1	1	1	1	8	14
20	1	10	1	1	1	1	1	1	3	1	2	3	1	0	0	4	0	0	0	100.8	101.4	101.1	16.7	16	15.6	48.3	1	1	1	1	8	16
21	1	10	1	1	1	2	1	1	3	1	5	1	2	2	0	0	4	4	6	99.5	106.2	102.9	20	18	17	55	1	1	1	1	9	15
22	1	10	2	2	1	2	1	1	2	1	5	1	2	2	6	4	0	0	0	99.2	102.8	101	17	19	15	51	1	1	1	1	8	17
23	1	10	1	1	2	3	1	1	2	1	5	3	2	2	0	0	0	0	5	96.7	98.6	97.6	16.7	14	13.4	44.1	1	1	1	1	9	17
24	1	10	2	1	2	3	2	1	3	1	5	3	1	1	1	7	6	0	0	107.8	102	104.9	17	14.7	16	47.7	1	1	1	1	8	15
25	1	10	1	1	3	1	2	2	3	1	4	2	1	2	0	0	0	0	0	96	95.8	95.9	16.6	16	15	47.6	1	1	1	1	9	17
26	1	10	2	1	3	2	2	1	2	1	5	2	2	3	1	0	0	8	3	98.2	97.6	97.9	19	17.1	16.6	52.7	1	1	1	1	8	15
27	1	10	1	1	2	2	2	1	2	2	5	3	2	0	0	0	0	2	1	103	102.6	102.8	17	16.3	16	49.3	1	1	1	1	8	16
28	1	10	1	1	3	3	2	1	3	2	2	3	1	0	0	4	5	0	0	96.7	98.8	97.7	15.2	14	14	43.2	1	1	1	1	8	17
29	1	9	2	1	2	2	1	1	2	1	5	1	1	4	0	0	5	2	0	98.3	99.4	98.9	17	16	17	50	1	1	1	1	8	16
30	1	9	1	1	3	2	1	1	1	1	5	3	1	0	0	2	5	6	5	107.8	102	104.9	19	19.4	17	55.4	1	1	1	1	9	17
31	1	9	1	1	3	2	1	1	1	1	5	2	1	2	0	0	3	0	1	96	97.6	96.8	21	20.2	19.6	60.8	1	1	1	1	8	16
32	1	9	1	1	3	2	1	1	1	1	2	3	2	3	0	0	0	4	9	99.7	97.6	98.6	18.3	17	18	53.3	1	1	1	1	9	17
33	1	9	1	1	2	2	1	1	2	1	5	1	1	0	0	0	5	0	0	103.5	106.4	105	16	15.5	16	47.5	1	1	1	1	9	17
34	1	9	1	1	2	2	2	1	2	1	1	1	1	2	6	0	19	0	2	100.8	101.2	101	21	19.8	18.7	59.5	1	1	1	1	9	16
35	1	9	2	1	2	2	2	1	1	1	5	2	1	0	0	0	4	0	1	97.2	95.8	96.5	18	17.2	17	52.2	1	1	1	1	8	17

36	1	9	2	1	2	2	2	1	3	1	5	3	1	5	6	0	0	0	0	93.3	95.2	94.3	19	18	18.3	55.3	1	1	1	1	9	17
37	1	9	2	1	2	2	1	2	3	1	5	3	1	5	0	0	10	0	0	103	98.8	100.9	17.1	18.2	16	51.3	1	1	1	1	9	16
38	1	9	1	1	3	3	1	1	3	1	5	1	2	0	0	4	16	0	0	99.5	101.68	100.6	16.4	17	14	47.4	1	1	1	1	8	17
39	1	9	1	1	3	2	2	1	2	1	2	1	1	0	0	4	0	9	7	105.8	104.6	105.2	19.2	18	18	55.2	1	1	1	1	8	17
40	1	9	1	1	3	2	1	1	2	2	5	3	1	3	0	0	18	0	0	92.8	97	94.9	17.4	17	18.2	52.6	1	1	1	1	8	15
41	1	9	1	1	3	2	1	1	2	1	4	3	1	0	0	0	0	4	1	99.7	98.8	99.2	15.2	14	18	47.2	1	1	1	1	9	16
42	1	9	2	1	2	2	2	1	3	1	1	3	1	1	4	0	12	0	0	103.5	104	103.8	18	19	18.5	55.5	1	1	1	1	8	17
43	1	9	1	1	2	2	1	1	3	1	3	1	1	0	0	0	4	6	0	97.3	99.6	98.5	19.2	17	18.3	54.5	1	1	1	1	9	16
44	1	9	1	1	2	3	1	1	1	1	3	1	1	2	3	0	0	0	0	102.7	101.4	102	21	19	18.9	58.9	1	1	1	1	9	16
45	1	9	1	1	1	2	1	1	1	1	3	1	1	4	4	6	0	0	0	96.8	99.4	98.1	19	18	16	53	1	1	1	1	8	17
46	1	9	2	1	1	3	1	1	2	2	2	3	2	6	0	0	0	4	6	106.5	102.2	104.4	17	16.7	18	51.7	1	1	1	1	9	16
47	1	9	1	1	1	2	1	1	1	1	5	3	1	0	0	0	7	5	7	102.8	99.6	101.2	18	17.4	17	52.4	1	1	1	1	8	16
48	1	9	2	1	3	3	2	1	3	1	1	3	1	2	1	5	0	0	0	104	99.4	101.7	14	15.2	15	44.2	1	1	1	1	9	17
49	1	9	1	1	3	2	1	1	2	1	1	2	2	0	0	0	1	2	5	106.8	102.4	104.6	18.9	18.2	16	53.1	1	1	1	1	8	15
50	1	9	1	1	2	2	1	1	2	2	1	3	1	0	0	4	0	0	0	93.3	95.2	94.3	19	17.2	17	53.2	1	1	1	1	8	15
51	2	10	2	1	2	3	1	1	1	1	3	3	1	7	4	4	8	5	0	88.5	84.6	86.55	26.1	24	26.9	77	3	3	3	2	8	12
52	2	10	1	1	4	2	1	1	2	1	1	3	2	0	0	0	22	7	3	92.3	81	86.65	29	18	19.4	66.4	2	1	2	1	8	15
53	2	10	1	2	1	2	1	1	2	1	1	1	1	0	1	0	23	7	0	84.3	90.6	87.45	19.4	18.6	16.8	54.8	2	2	2	1	8	15
54	2	10	1	1	3	2	2	1	3	2	1	3	2	9	4	3	8	0	0	74.3	78	76.15	16.8	14.7	15	46.5	3	3	3	2	8	13
55	2	10	1	1	2	2	2	1	1	1	5	3	1	0	2	0	8	0	0	83.3	78	78.65	16.7	14.5	14	45.2	1	1	2	1	8	16
56	2	10	1	1	2	2	2	1	3	1	1	2	1	6	4	6	0	0	0	86.1	87	86.55	18.7	19.6	16	54.3	2	2	2	1	9	17
57	2	10	1	1	2	2	1	1	3	1	2	2	1	7	0	0	23	7	3	87.1	81	86.65	18.7	16	19.6	54.3	2	2	2	2	8	16
58	2	10	1	1	3	2	1	2	2	1	5	2	1	0	0	0	24	9	13	95	95.4	95.2	21.7	17	16	54.7	1	1	2	1	8	17
59	2	10	2	1	2	2	1	1	3	1	5	2	1	0	0	2	24	4	0	84.3	78	81.15	18.7	16	15.3	50	2	2	2	2	8	17
60	2	10	2	1	3	2	2	1	3	1	5	3	2	0	2	0	6	10	2	87.1	84.6	85.85	19.4	18.6	17	55	1	1	2	1	8	17
61	2	10	1	1	2	2	1	1	2	1	5	3	1	8	5	0	4	0	0	88.3	86.6	87.45	20.9	19	17.7	57.6	1	1	2	1	8	16
62	2	10	1	1	2	3	1	1	2	2	2	2	2	0	0	2	18	8	0	88.3	86.6	87.45	20.4	18	15.3	53.7	1	1	2	1	8	17
63	2	10	2	1	2	3	1	1	2	2	5	2	2	0	2	0	4	0	0	85.8	84.2	85	21.8	19.2	17.3	58.3	1	1	2	1	9	16
64	2	10	1	1	2	3	1	1	2	2	5	2	1	0	4	3	6	0	0	79.5	81.4	80.45	23	15.6	14	52.6	1	1	2	1	8	15
65	2	10	1	1	2	2	2	1	3	1	3	2	1	4	2	0	14	0	0	79.5	78.8	79.15	21	19.1	17	57.1	1	1	2	1	9	16
66	2	10	2	2	3	2	1	1	3	1	5	2	2	6	0	4	0	0	0	83.8	82.2	83	26.4	18.7	16	61.1	2	2	2	1	8	16
67	2	10	2	1	2	2	1	1	1	2	5	3	2	0	0	2	22	6	0	81.6	81.4	81.5	18.7	17	19.6	55.3	1	2	2	1	8	14
68	2	10	2	1	2	2	1	1	1	1	5	3	1	5	2	0	6	0	0	85.8	84.2	85	20.2	18	16.3	54.5	1	1	2	1	8	14
69	2	10	2	1	2	2	1	1	2	1	5	3	2	3	0	0	8	0	0	87.8	76	81.9	20.2	18	14.9	53.1	3	2	3	2	8	11
70	2	10	1	1	3	3	2	1	2	1	4	3	1	0	0	0	8	9	7	79.5	81.4	80.45	18.9	13.7	13	45.6	1	2	2	1	7	16
71	2	10	2	2	1	2	1	1	2	1	1	3	2	0	0	2	18	0	0	77.6	78.8	78.2	21.1	18.6	17	56.7	1	1	2	1	8	15
72	2	10	2	1	1	2	2	1	3	1	4	3	2	6	4	0	20	0	0	81.6	81.4	81.5	21.5	17	18.2	56.7	1	1	2	1	8	16
73	2	10	1	1	1	2	2	1	2	1	5	3	2	4	0	2	8	0	0	83.6	84.4	84	19.6	20.1	19	58.7	1	1	2	1	8	17
74	2	10	1	1	3	3	1	1	3	2	2	2	2	0	0	0	24	9	0	93.5	93.6	93.5	17.5	17	16.2	50.7	1	1	2	1	8	17

75	2	9	1	1	3	2	1	1	2	1	5	2	1	0	0	3	14	2	0	87.6	90.8	89.2	19.7	20	17	56.7	1	1	2	1	8	17
76	2	9	2	1	3	2	1	1	2	1	4	1	2	4	6	0	6	0	0	95.3	88.4	91.8	24.3	18	19.6	61.9	3	3	3	1	7	12
77	2	9	1	2	1	2	1	1	5	1	3	3	1	5	3	0	0	0	0	86.33	84.4	85.3	24	23	18	65	2	2	2	1	8	15
78	2	9	1	1	1	3	2	1	4	1	2	1	2	0	0	0	18	9	2	92	93.4	92.7	23.5	19.8	18	61.3	1	1	2	1	8	17
79	2	9	2	1	3	2	2	1	2	1	5	3	1	2	0	0	0	0	0	87.6	90.8	89.2	19	17.8	18.6	55.4	1	1	2	1	9	16
80	2	9	1	1	2	2	1	1	3	1	5	3	2	8	6	5	10	6	0	100.6	94	97.3	16	14.5	15	45.5	1	1	2	1	7	16
81	2	9	1	1	3	3	2	2	2	1	2	2	2	3	6	0	0	0	0	83.3	90.4	86.65	16	19.4	16	51.4	1	1	2	1	8	16
82	2	9	1	1	2	2	1	1	2	2	2	2	1	4	6	0	4	0	2	86.5	100	93.25	18.5	15	15.2	48.7	1	1	2	1	8	15
83	2	9	1	1	3	2	1	1	3	1	5	3	1	3	6	0	0	0	6	86.6	91.6	89.1	21	20.3	17.6	58.9	1	1	2	1	8	15
84	2	9	2	1	2	2	2	1	2	1	5	2	1	6	8	0	0	4	0	86.5	95.8	91.1	23.5	18.4	19	60.9	1	1	2	1	7	15
85	2	9	2	1	1	2	1	1	3	2	1	2	1	2	0	0	0	0	0	84.8	89	86.9	21.6	23	18.4	63	1	1	2	1	7	16
86	3	10	1	2	1	2	1	1	1	1	3	3	1	6	2	6	10	0	0	88.8	95.4	92.1	17.3	14	13.2	44.5	1	1	2	3	8	16
87	3	10	2	1	2	2	1	2	1	1	1	2	2	3	2	0	22	0	0	69.8	77.8	73.8	16.4	14	13.2	43.6	3	3	3	3	7	11
88	3	10	1	1	4	3	2	1	2	1	5	3	1	9	2	4	10	0	0	84.3	90.6	87.45	29	24	16	69	3	2	3	3	8	13
89	3	10	1	1	2	2	1	1	4	1	2	3	1	6	6	0	8	9	4	78	71.4	74.7	22.3	16	16.3	54.6	3	3	3	3	7	13
90	3	10	1	1	2	2	1	1	3	1	5	1	2	8	3	0	6	0	0	78	71.4	74.7	23.9	18.8	23.1	65.8	3	3	3	3	7	11
91	3	10	1	1	3	2	1	1	3	2	2	3	2	3	2	0	12	0	0	79.6	89.6	84.6	21.5	19	15.4	55.9	1	1	2	3	7	12
92	3	9	2	1	2	2	1	1	3	1	1	1	2	9	4	0	0	0	0	77.6	81.4	80.45	22	26	19.9	67.9	3	3	3	3	7	11
93	3	9	1	1	2	2	2	1	3	1	1	1	1	0	0	3	10	4	0	77.6	81.4	80.45	23.4	21	19	63.4	3	3	3	3	7	11
94	3	9	1	2	3	2	1	1	3	1	4	1	2	2	4	0	22	10	14	88.3	98	93.15	23	17	15.4	55.4	3	3	3	3	8	12
95	3	9	1	1	2	2	1	1	3	1	5	1	1	0	0	4	6	0	0	77.6	79.6	78.6	21.4	17.4	17	55.8	3	3	3	3	7	12
96	3	9	2	1	2	1	1	2	3	1	4	1	2	2	0	0	0	0	4	94.8	103.6	103.5	18.5	16	15.8	50.3	1	0	2	3	8	15
97	3	9	1	1	3	1	2	1	2	1	3	3	1	0	0	0	10	10	14	88.3	98	93.15	23.5	21.7	15	60.2	1	1	2	3	7	10
98	3	9	1	2	3	3	2	1	2	1	1	2	2	0	0	3	0	6	0	86.5	100	93.25	18	16	16.4	50.4	1	1	2	3	8	17
99	3	9	1	1	2	3	1	1	3	1	1	3	1	0	0	0	10	6	0	90.8	95.8	93.3	21.4	16	13.5	50.9	3	3	3	3	8	11
100	3	9	2	1	2	2	2	1	2	1	5	3	1	8	4	3	0	0	0	76.5	88.8	82.6	24	18.5	21	63.5	2	2	2	3	8	11